

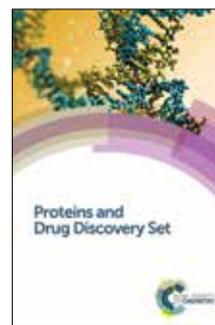
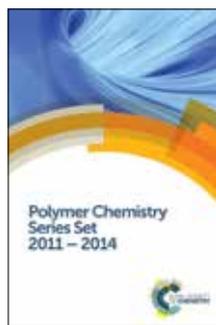
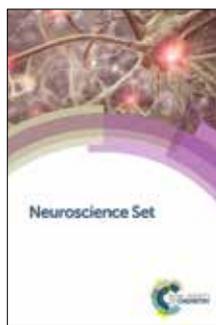
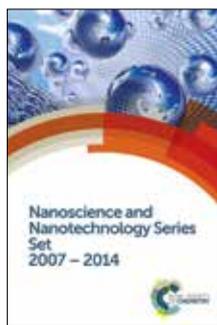
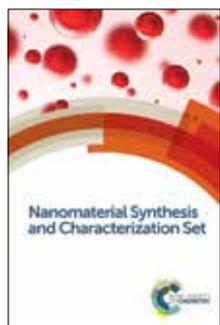
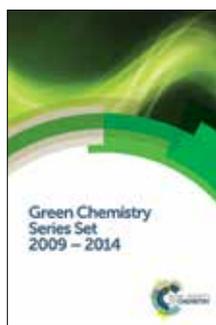
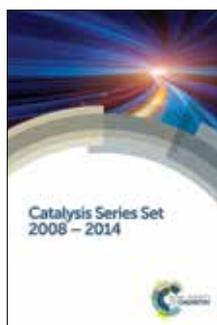
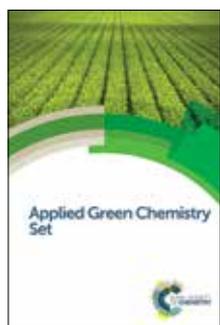
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Introduction

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Contents

Book series

Advances in Chemistry Education Series	3	New Developments in Mass Spectrometry	33
Catalysis Series	4	New Developments in NMR	34
Chemical Biology	6	Polymer Chemistry Series	37
Comprehensive Series in Photochemical & Photobiological Sciences	8	Smart Materials Series	39
Drug Discovery	10	Theoretical and Computational Chemistry Series	42
Energy and Environment Series	12	Specialist Periodical Reports	44
Faraday Discussions	15	Textbooks, popular science and standalone titles	48
Food Chemistry, Function and Analysis	18	Other products	58
Green Chemistry Series	21	Contacts and ordering information	
Issues in Environmental Science and Technology	24	Agents and representatives	60
Issues in Toxicology	25	Royal Society of Chemistry contacts	61
Metallobiology	28	Publications order form	62
Monographs in Supramolecular Chemistry	30	Index	63
Nanoscience & Nanotechnology Series	31		

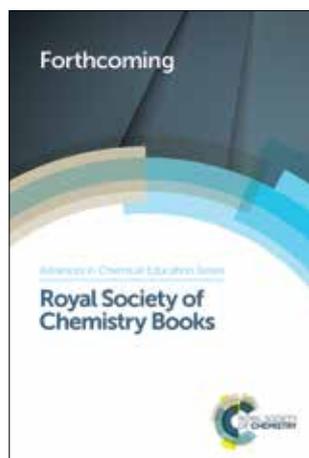
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Advances in Chemistry Education Series



About the series

ISSN: 2056-9335

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Keith Taber University of Cambridge, UK

Series editors

Avi Hofstein The Weizmann Institute of Science, Israel | **Vicente Talanquer** University of Arizona, USA | **David Treagust** Curtin University, Australia

Books in this series review developments in areas of chemistry education internationally or report on a single educational context where the work has clear international significance; cover formal education, informal education, teacher education/development or public understanding of chemistry; and cover innovations in chemical education practice where suitable evidence of research-based evaluation is included. Topics covered will include approaches to teaching chemistry and chemistry topics; the use of technology in chemistry teaching and learning; assessment of learning in chemistry education; chemistry in the curriculum; chemistry teacher preparation and development; initiatives to improve public understanding of chemistry; and developments in research methodology as applied in chemistry education. The series provides volumes of high quality and significance in the field of chemistry education research for researchers and postgraduates.

Laboratory Teaching in Higher Education Chemistry

Michael K Seery University of Edinburgh, UK

Examining a typical undergraduate chemistry degree course, this book explores current laboratory curriculum design. Examining learning outcomes and assessment, the book provides a framework for designing a new curriculum that gives a better experience for students as well as better assessment opportunities for instructors. This is a practical guide for instructors as well as an interesting review for chemistry education researchers.

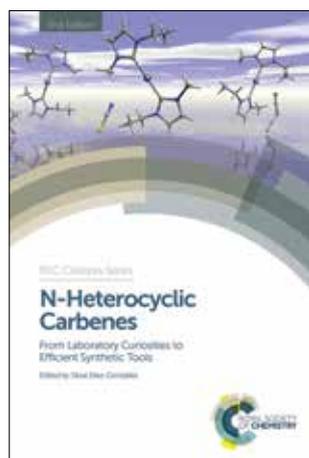
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ISBN 978-1-78262-965-8



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Catalysis Series



About the series

ISSN: 1757-6725

Editor-in-chief

Chris Hardacre Queen's University Belfast, UK

Series editors

Jose Rodriguez Brookhaven National Laboratory, USA | **Bert Klein Gebbink** Utrecht University, The Netherlands

Catalysis is a major area of scientific research covering numerous fields of chemistry, and is a key factor in tackling many of the scientific challenges faced today, such as renewable energy systems and environmental protection. The books in this series provide an accessible reference for postgraduates, academics and industrialists working in this exciting field. The books cover both the research developments and applications of catalysis, across academia and industry.

Biocatalysis

An Industrial Perspective

Gonzalo de Gonzalo Universidad de Sevilla, Spain | **Pablo Dominguez de Maria** Sustainable Momentum, SL, Canary Islands, Spain

Bridging the gap between research and industry, this book focuses solely on the use of biocatalysis in industry. Contributors discuss aspects of their current research or already implemented commercialized processes; provide thoughts on the industrial motivation to use biocatalysis and how to succeed in industrial biotransformations; and explore current challenges for further research. This unique volume is an inspirational guide for industrialists and researchers, providing valuable information for the set-up of future biocatalytic industrial concepts.

Hardback | 500 pages | 9781782626190 | 2018 | £179.00 | \$300.00 

ISBN 978-1-78262-619-0



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Dienamine-, Trienamine- and Aminoenyne-mediated Reactions in Organic Synthesis

Dhevalapally B Ramachary University of Hyderabad, India | **Indresh Kumar** Birla Institute of Technology and Sciences, India

Dienamine-, trienamine- and aminoenyne-mediated reactions provide an efficient approach for the organic synthesis of bioactive molecules and natural products. The book covers the chemistry of the reactions from "preformed species" to "in situ species" and its applications in synthesis. The book is ideal for graduate students as well as researchers in academia and industry interested in catalysis, organic synthesis, natural products and drug discovery.

Hardback | 250 pages | 9781782620907 | 2017 | £149.00 | \$245.00 

ISBN 978-1-78262-090-7



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Catalysis Series

Modern Biocatalysis

Advances Towards Complex Synthetic Biological Systems

Gavin Williams North Carolina State University, USA | **Melanie Hall** University of Graz, Austria

Surveying current state-of-the-art techniques, this book provides a comprehensive overview of this exciting field. The book focuses on modern techniques that generate better performing enzymatic systems and novel biosynthetic routes to (non-)natural products. This includes the use of molecular techniques in protein design and engineering, the construction of artificial metabolic pathways and the application of computational methods for enzyme discovery and design. The book provides researchers with a greater understanding of current and emerging trends in biocatalysis.

Hardback | 300 pages | 9781782627265 | 2017 | £149.00 | \$245.00 



Zeolites in Catalysis

Properties and Applications

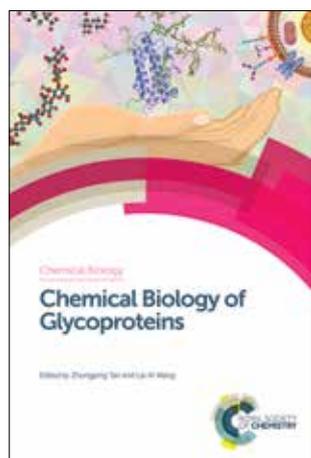
Jiri Cejka J. Heyrovský Institute of Physical Chemistry, Czech Republic | **Russell E Morris** University of St Andrews, UK | **Petr Nachtigall** Charles University of Prague, Czech Republic

Covering zeolite synthesis, characterisation and applications, this book concisely defines zeolite science so readers can quickly grasp the most important and most exciting aspects of the field. It reviews the latest developments, challenges and potential applications of zeolites, making it ideal for researchers and postgraduate students new to this field.

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Chemical Biology



About the series

ISSN: 2055-1975

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Tom Brown University of Oxford, UK

Series editors

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Nick J Westwood University of St Andrews, UK

The Chemical Biology Series is a new venture that aims to provide a comprehensive suite of reference books on developing areas at the interface of chemistry and biology. Chapters written and edited by experts worldwide will introduce practical aspects and best methods, will explain the fundamental chemistry knowledge, and will provide forward-looking perspectives. Ultimately, the series aims to aid postgraduate students and researchers apply chemical tools and understand current challenges in the field. The books will provide a valuable reference for scientists working outside their own area of current expertise or looking to engage in chemical biology research. Coverage will include topics such as analytical and computational tools, chemical probes, imaging, glycosciences, genomics and transcriptomics, chemical genetics and gene editing tools, and aspects of synthetic biology.

Computational Tools for Chemical Biology

Sonsoles Martín-Santamaría Centro de Investigaciones Biológicas CIB-CSIC, Spain

The field of computational chemical biology involves utilising the latest techniques to visualise and manipulate processes within living cells. The rapid development of efficient computational tools has allowed researchers to tackle biological problems and to predict, analyse and monitor, at an atomic level, molecular recognition processes. This book, with contributions from internationally renowned experts as well as new leaders in the field, offers a fresh perspective on how computational tools can aid the chemical biology research community.

Hardback | 275 pages | 9781782627005 | 2017 | £179.00 | \$300.00 



Cyclic Peptides

From Bioorganic Synthesis to Applications

Wilfred A van der Donk University of Illinois, USA | **Jesko Koehnke** University of St Andrews, UK |
James Naismith University of St Andrews, UK

Cyclic peptides are increasingly being employed as a chemical tool in biology and drug discovery. This book provides the reader with a comprehensive overview of the synthesis and applications of these useful molecules. Following an introduction to cyclic peptides, biosynthetic and traditional chemical routes to cyclic peptides are reviewed, analysis of cyclic peptides is discussed and, finally, a number of chapters are dedicated to their applications. A timely collection of chapters by leading researchers in the field, this book will be an essential resource for students, researchers and industrialists in medicinal, bioorganic, natural product and analytical chemistry.

Hardback | 300 pages | 9781782625285 | 2018 | £159.00 | \$260.00 



Chemical Biology

Mass Spectrometry in Chemical Biology

Evolving Applications

Norberto Peporine Lopes University of Sao Paulo, Brazil | **Ricardo Roberto da Silva** University of Sao Paulo, Brazil

Mass spectrometry is one of the most widespread technologies in chemistry and has been increasingly used in biology with the rise of omics sciences. This book summarises important mass spectrometry related methodological approaches and applications in the field of chemical biology. It provides an important compendium of theoretical and experimental techniques that can be applied to study a wide range of problems in biological systems and would therefore be of great interest to students and researchers in the fields of analytical chemistry, biochemistry and chemical biology.

Hardback | 275 pages | 9781782625278 | 2017 | £159.00 | \$260.00 



Mechanisms of Primary Energy Transduction in Biology

Marten Wikström University of Helsinki, Finland

Written and edited by leading experts in the field, this book describes the events of primary energy transduction in life processes. It focuses in particular on recent structural results and new biophysical insights that have been made possible by recent advances in high-resolution protein structures, in physical techniques to study reactions in real time, and in computational methods to study and refine both structures and their dynamics. Biochemists, biophysicists and chemical biologists will find this book an essential resource for a complete understanding of the molecular machines of bioenergetics.

Hardback | 400 pages | 9781782628651 | 2018 | £179.00 | \$300.00 



Protein Crystallography

Challenges and Practical Solutions

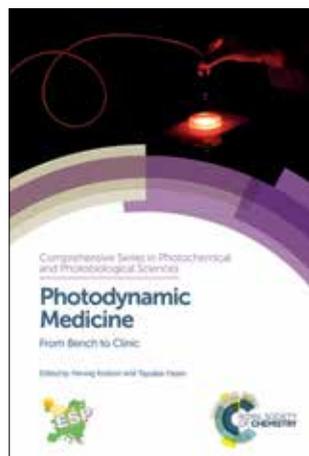
Konstantinos Beis Imperial College London, UK | **Gwyndaf Evans** Diamond Light Source, UK

Protein crystallography has become vital to further understanding the structure and function of many complex biological systems. With contributions from world leading researchers whose software are used worldwide, this book provides a coherent approach on how to handle difficult crystallographic data and assess its quality. Chapters will cover all key aspects of protein crystallography, from instrumentation and data processing through to model building. This book is ideal for both academics and researchers in industry looking for a comprehensive guide to protein crystallography.

Hardback | 275 pages | 9781782627289 | 2018 | £159.00 | \$260.00 



Comprehensive Series in Photochemical & Photobiological Sciences



About the series

ISSN: 2041-9716

Series editors

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Massimo Trotta Istituto per i Processi Chimico Fisici-CNR, Italy

Initiated by the European Society for Photobiology this series provides comprehensive overviews on specific areas of photoscience, giving in-depth coverage of the very different fields related to light effects. It embraces both well-established and emerging fields and allows investigators, physicians, industrialists and postgraduate students to obtain an updated account in specific areas and a ready access to the recent literature. Importantly, books in this series provide a critical evaluation of the directions that the field is taking.

Light in Forensic Science

Issues and Applications

Giorgia Miolo University of Padova, Italy | **Jacqueline L Stair** University of Hertfordshire, UK |

Mire Zloh University of Hertfordshire, UK

The identification and quantification of material present and collected at a crime scene are critical requirements in investigative analyses. In this book, the use of light and lab technicians' tools based on light to provide proof of evidence are presented, with various examples of light-based techniques. Equally covered are the negative effects of light in the degradation of forensic evidence. Edited by active forensic scientists, this book will be of interest to students and researchers in the fields of photochemistry, photobiology, toxicology and forensic science.

Hardback | 350 pages | 9781782627685 | 2018 | £179.00 | \$300.00 



Microalgal Hydrogen Production

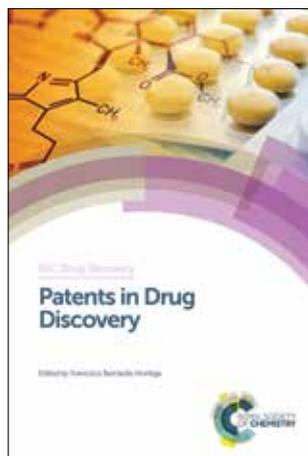
Giuseppe Torzillo National Research Council of Italy (CNR), Italy | **Mike Seibert** National Renewable Energy Laboratory, USA

This comprehensive book highlights the key steps necessary for future exploitation of solar-light-driven hydrogen production by microalgae. The highly regarded editors bring together contributors from key institutions in order to suggest and examine the most significant issues that must be resolved to achieve the goal of practical implementation, while proposing reliable methodologies and approaches to solve such issues. This book will be an indispensable resource for advanced students, researchers and professionals working across the field of bioenergy.

Hardback | 350 pages | 9781849736725 | 2017 | £179.00 | \$300.00 



Drug Discovery



About the series

ISSN: 2041-3203

Editor-in-chief

David Thurston King's College London, UK

Series editors

David Fox Vulpine Science and Learning, UK | **Ana Martinez** Centro de Investigaciones Biologicas-CSIC, Spain | **David Rotella** Montclair State University, USA

The Drug Discovery series covers all aspects of drug discovery and medicinal chemistry and contains over fifty books published since 2010. Providing comprehensive coverage of this important and far-reaching area, the books encourage learning in a range of different topics and provide valuable reference for scientists working outside their own areas of expertise. Books feature case studies to bring different aspects of the drug discovery process alive and they detail the fundamental science necessary for understanding through to the most up-to-date discoveries and cutting-edge technology. Chapters are written and edited by experienced researchers from both industry and academia. This series will be of particular interest to postgraduate students and medicinal chemists and biochemists working in academia or industry.

Antibiotic Drug Discovery

New Targets and Molecular Entities

Steven Firestone Wayne State University, USA | **Troy Lister** Spero Therapeutics, USA

Recent years have seen an important resurgence in antibiotic drug discovery. Coupled with this new interest has been progress towards the discovery and elucidation of new targets for antibacterial drug discovery. Additionally, vast amounts of research on the current state-of-the-art for infectious disease drug discovery have been published. This book collates the most recent and compelling strategies for antibiotic drug discovery, with a primary focus on new targets, mechanisms and molecular entities.

Hardback | 250 pages | 9781782624240 | 2017 | £159.00 | \$260.00 

ISBN 978-1-78262-424-0



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Biophysical Techniques in Drug Discovery

Angeles Canales Universidad Complutense de Madrid, Spain

Biophysical techniques are used in many key stages of the drug discovery process including screening of new ligands for a certain receptor, characterisation of a drug mechanism and validation of data from biochemical and cellular assays. This title, with contributions from both academia and industry, brings together the different elements of biophysical techniques within drug discovery in a single volume. Topics covered include the characterisation of integral membrane proteins and their interactions with drugs, G protein-coupled receptors and important developments in the field such as improvement in electron microscopy resolution.

Hardback | 300 pages | 9781782627333 | 2018 | £159.00 | \$260.00 

ISBN 978-1-78262-733-3



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Drug Discovery

Drug Discovery for Leishmaniasis

Carmen Gil Centro de Investigaciones Biológicas (CSIC), Spain | **Luis Rivas** Centro de Investigaciones Biológicas (CSIC), Spain

From a human health perspective, Leishmaniasis is the second most important protozoan disease, superseded only by malaria. Between 10 and 12 million people are affected by the disease and with no known vaccine, the development of new drugs is urgently required. This volume provides a perspective of current treatments and their challenges as well as discussing emerging strategies and methodologies that will drive new drug development for this 'neglected' disease.

Hardback | 250 pages | 9781782628897 | 2017 | £149.00 | \$245.00 



Patents in Drug Discovery

Francisco Bernardo ABG Patentes, Spain

Written and edited by experts working within the field, this book will provide an essential guide for non-specialists to this specific area of patent law. It includes chapters and case studies on the role of patents in the pharmaceutical industry, on what is patentable and what is not in the pharma and biotech fields, on how to draft a patent application and obtain patent rights in different jurisdictions and on how to manage the lifecycle of a medicament.

Hardback | 560 pages | 9781849738842 | 2017 | £175.00 | \$290.00 



Pharmaceutical Formulation

The Science and Technology of Dosage Forms

Geoffrey D Tovey Visiting Professor King's College London and Chief Executive Geoff Tovey Associates, UK

This book will provide the reader with the latest information on the principles and practice of pharmaceutical formulation. Covering a wide range of dosage forms intended for human administration of pharmaceuticals, this text also takes into account modern processing methods and recent changes in the regulatory and quality demands of the industry. Pharmaceutical Formulation will be an essential book for students and researchers working both in academia and in the pharmaceutical industry.

Hardback | 350 pages | 9781849739412 | 2018 | £169.00 | \$275.00 



Small-molecule Transcription Factor Inhibitors in Oncology

Khondaker Miraz Rahman King's College London, UK | **David Thurston** King's College London, UK

This title highlights recent progress in the development of small-molecule inhibitors of oncogenic transcription factors. It also presents the evidence that this important protein class can be modulated in a number of ways to develop novel classes of therapeutic agents for anticancer treatments. This book is a unique reference book for postgraduates, academic researchers and practitioners working in the fields of biochemistry, biotechnology, cell and molecular biology and bio-inorganic chemistry.

Hardback | 250 pages | 9781782621454 | 2017 | £149.00 | \$245.00 



Drug Discovery

Theranostics and Image Guided Drug Delivery

Maya Thanou King's College London, UK

Understanding drug bio-distribution is a crucial step in developing new methods and mechanisms for targeted drug delivery. Molecular imaging of drugs and drug carriers is a valuable tool that can provide important information on their spatiotemporal distribution, allowing improved drug distribution at the target sites. This book introduces the topic of image guided drug delivery and covers the latest imaging techniques and developments in theranostics, highlighting the interdisciplinary nature of this field.

Hardback | 400 pages | 9781782624660 | 2017 | £179.00 | \$290.00 

ISBN 978-1-78262-466-0



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Zebrafish in Drug Discovery

Alexander D Crawford Université du Luxembourg, Luxembourg | Camila V Esguerra Biotechnology Centre of Oslo, Norway

The use of the zebrafish model as drug discovery and safety screening platforms has grown in biomedical research and the pharmaceutical industry. This book provides a much-needed summary of zebrafish-based drug discovery, highlighting not only the latest disease models in various indication areas and their use for small-molecule screens, but also the latest technologies and tools important for zebrafish-based drug discovery and toxicity research. A unique feature of Zebrafish in Drug Discovery is a chapter summarizing the intellectual property situation for zebrafish technologies relevant for drug discovery.

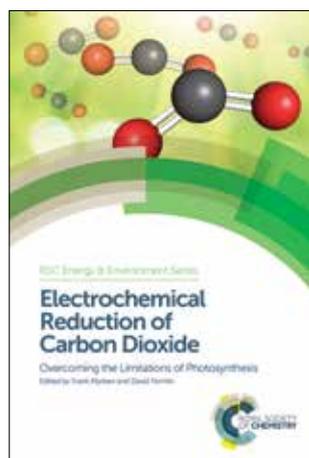
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Energy and Environment Series



About the series

ISSN: 2044-0774

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Heinz Frei Lawrence Berkeley National Laboratory, USA

Series editors

Roberto Rinaldi Imperial College London, UK

Energy lies at the heart of modern society, and it is critical that we make informed choices of the methods by which we convert and manage energy. This series provides up-to-date and critical perspectives on the various options that are available. The wide range of topics covered reflects the wealth of chemical ideas and concepts that have the potential to make an important impact the search for sustainable energy. Books in this series form important references for chemical and material scientists, chemical and process engineers, energy researchers, bio-scientists and environmental scientists from across academia, industry and Government.

Advances in Photoelectrochemical Water Splitting

Theory, Experiment and Systems Analysis

S David Tilley University of Zurich, Switzerland | Stephan Lany National Renewable Energy Laboratory, USA | Roel van de Krol Helmholtz Zentrum Berlin, Germany

With a strong focus on theory, this book is an up-to-date review of photoelectrochemical water splitting. The book discusses prediction of band alignments, the discovery of novel materials with attractive band gaps and stability; recent developments such as protective overlayers for photoanodes and in operando X-ray measurements of PEC cells; and concludes with a systems analysis of photoelectrochemical water splitting technologies. It is an important reference for researchers working in solar fuels as well as those working in theoretical chemistry.

Hardback | 250 pages | 9781782629252 | 2018 | £149.00 | \$245.00 

ISBN 978-1-78262-925-2



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Electrochemical Reduction of Carbon Dioxide

Overcoming the Limitations of Photosynthesis

David Fermin University of Bristol, UK | Frank Marken University of Bath, UK

One of the crucial challenges in the energy sector is the efficient capture and utilisation of CO₂ generated from fossil fuels. This book covers the most recent developments in the field of electrochemical reduction of CO₂, from first-principle mechanistic studies to technological perspectives. An introduction to basic concepts in electrochemistry and electrocatalysis is included to provide a background for newcomers to this field. This book provides a comprehensive overview for researchers and industrial chemists working in environmental science, electrochemistry and chemical engineering.

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ISBN 978-1-78262-042-6



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Energy and Environment Series

Integrated Solar Fuel Generators

Ian D Sharp Lawrence Berkeley National Laboratory, USA | **Harry A Atwater** California Institute of Technology, USA | **Hans-Joachim Lewerenz** Helmholtz-Zentrum Berlin, Germany

Exploring integrated artificial photosystems, this book discusses the scientific and engineering efforts to overcome the formidable challenges involved with this solar fuels technology. It describes the critical areas of research and development towards viable integrated solar fuels systems, the current state of the art of these efforts, and outlines the future research needs that will accelerate progress towards a deployable technology. It is an important reference for researchers and industrialists in chemistry and engineering working in solar energy conversion.

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Lignin Valorization

Emerging Approaches

Gregg T Beckham National Renewable Energy Laboratory, USA

Lignocellulosic biomass represents a vast resource for the sustainable production of renewable fuels, chemicals, and materials. This book reviews the latest breakthroughs and challenges in upgrading lignin to fuels and chemicals. Bringing together biology, catalysis, engineering, and analytical chemistry, it presents a comprehensive picture of how lignocellulosic biorefineries could potentially employ lignin valorization technologies. It is ideal for graduate students and researchers working in lignin as well as industrialists working in biorefinery technologies.

Hardback | 500 pages | 9781782625544 | 2017 | £179.00 | \$300.00 



X-Ray Free Electron Lasers

Applications in Materials, Chemistry and Biology

Uwe Bergmann Stanford University, USA | **Vittal Yachandra** Lawrence Berkeley National Laboratory, USA | **Junko Yano** Lawrence Berkeley National Laboratory, USA

Introducing the principles and properties of the currently operating and future X-ray free electron lasers (XFELs) and their applications in the fields of materials, chemistry and biology, this book brings readers up to date with recent advances. Focusing on breakthroughs using the revolutionary properties of XFEL radiation, it is ideal for researchers.

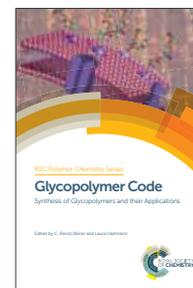
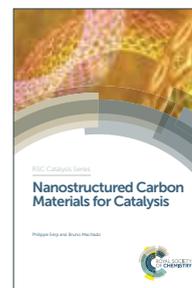
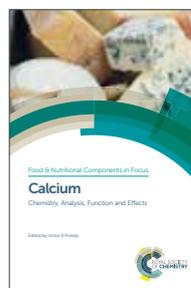
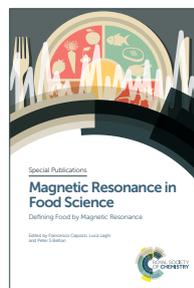
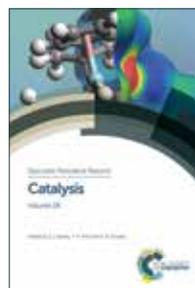
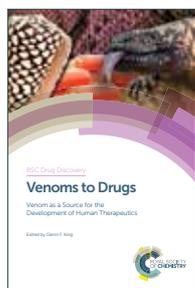
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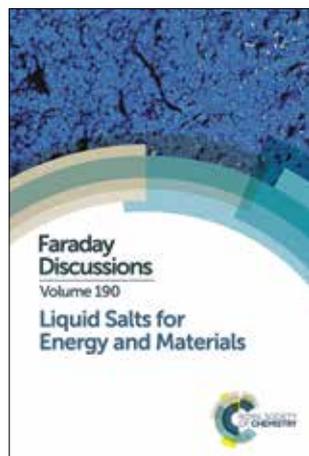
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Faraday Discussions covers a variety of topics in rapidly developing areas of the physical sciences, with a focus on physical chemistry and its interfaces with other scientific disciplines. The journal publishes the papers presented and a record of the questions, discussion and debate that took place at the corresponding Faraday Discussions meeting and provides an important record of current international knowledge and opinions in the relevant field. Each Faraday Discussion covers a topic in a rapidly developing area of chemistry, and will be of interest to academic and industrial chemists across all areas of the chemical sciences

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The discovery of aggregation-induced emission (AIE) has attracted much interest as it offers a new platform for the exploration of practically useful luminescent materials. This Faraday Discussion discusses current challenges in this field, and potential breakthroughs that may be accomplished in the near future. It focuses on the issues associated with the development of new fluorescent and phosphorescent AIEgens.

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Halogen Bonding in Supramolecular and Solid State Chemistry

The halogen bond may be considered as a special case of sigma-hole bonding, wherein an electron donor interacts with the electrophilic region of a halogen atom. Developing a fundamental understanding of key aspects of non-covalent interactions in solid-state materials, solution chemistry, biochemistry and the gas phase, this Faraday Discussion unites experimentalists and theoreticians, who are pushing the applicability of this broad class of interactions far beyond only the halogens.

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Liquid Salts for Energy and Materials

Focussing on the fundamental properties and state of the art in liquid salts, this Faraday Discussion brings together scientists and engineers from academia and industry. The application of liquid salts in tackling some of the most important current global challenges is covered, including their benefits to energy efficiency and environmental impact, their role in improving energy conversion and storage and how molten salt reactors can improve nuclear fuel processing.

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Faraday Discussions

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Metal-organic frameworks (MOFs), covalent-organic frameworks (COFs), and related molecular porous materials have entered a stage where not just the porosity, but other physical attributes are now playing a major role in their properties. This Faraday Discussion explores several important new directions in the chemistry of porous crystalline materials. It develops a fundamental understanding of key aspects in the chemistry of porous crystalline materials: chemical properties, electronic properties and physical properties.

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Reaction rate theory has developed rapidly in recent years and is being used to interpret and simulate an ever growing range of challenging rate-processes in chemistry, physics and biology. This Faraday Discussion brings together theoretical and physical chemists, molecular biologists, solid state physicists and bio-physicists in academia and industry to discuss recent advances in reaction rate theory.

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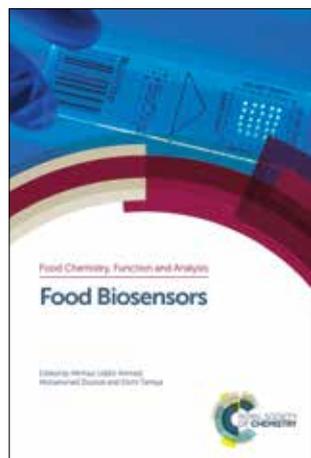
Surface Enhanced Raman Scattering - SERS

Academic and industrial interest in surface-enhanced Raman scattering (SERS) has grown over the past decade. This book discusses SERS enhancement from plasmonic and possibly non-plasmonic enhancing surfaces; applications in biological studies, including immunoassays and ultrasensitive biomolecular detection; single molecule detection; tip-enhanced Raman scattering (TERS); and analytical applications. This Faraday Discussion introduces new emerging areas and explores the diverse range of approaches and disciplines contributing to the growth and understanding of this optical phenomenon.

Hardback | 450 pages | 9781782629429 | 2018 | £170.00 | \$270.00



Food Chemistry, Function and Analysis



About the series

ISSN: 2398-0656

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Food Chemistry, Function and Analysis provides a suite of reference books focusing on food chemistry, the functions of food in relation to health and the analytical methods and approaches used by scientists in the area. Providing comprehensive coverage of important topics such as the biochemistry of food, physical properties and structure, efficacy and mechanisms of bioactives in the body including biomarkers, nutrient physiology/metabolism and interactions and the role of nutrition and diet in disease. The series is aimed at academic and industrial researchers and graduate students in food science and chemistry as well as for physicists, biochemists, nutritionists and others who work at the interface of the chemistry, physics and biology of food.

Edible Oil Structuring

Concepts, Methods and Applications

Ashok R Patel Ghent University, Belgium

The application of lipid science and technology to real food system has become increasingly interesting for industrial scientists. Providing a comprehensive and concise overview of the field of edible oil structuring, this book uniquely emphasises the latest developments from the last five years. Specifically, new insights into the gelation behaviour of several categories of building blocks will be presented along with some potential food applications. The book will conclude with a discussion on the unresolved challenges and future perspectives related to this emerging area. Appealing to those with an industrial need and a curiosity for fundamental research, this book enables the reader to get a comprehensive understanding of the recent developments in this field.

Hardback | 300 pages | 9781782628293 | 2017 | £149.00 | \$245.00 

ISBN 978-1-78262-829-3



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Food Irradiation Technologies

Applications for Preservation

Isabel Ferreira Instituto Politécnico de Bragança, Portugal | **Amilcar L Antonio** Polytechnic Institute of Bragança, Portugal | **Sandra Cabo Verde**

Food preservation is being achieved using several technologies dependant on the specific purpose, the technical and economic feasibility and the level of consumer acceptance. Using irradiation is being recognised as a feasible alternative technology for food preservation which is more environmentally friendly than other current processes such as post-harvest chemical fumigation and it has less impact on thermally sensitive compounds than thermal decontamination technologies such as hot water or steam. The technology is no longer as hard to access and expensive and this book shows the various ways it can best be utilised providing a useful reference for those working or researching food preservation.

Hardback | 375 pages | 9781782627081 | 2018 | £169.00 | \$275.00 

ISBN 978-1-78262-708-1



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Food Chemistry, Function and Analysis

Sensing Techniques for Food Safety and Quality Control

Xiaonan Lu University of British Columbia, Canada

As the next generation of detection techniques develops, sensors have many advantages over more conventional tools for the analysis of food safety and quality, such as high-throughput, ultra-fast, less-destructive, portable and accurate. This book provides an updated summary of the application of different types of sensors and looks at the prospective and future trends in each topic. The editor and authors are experts in designing and constructing different types of sensors in food analysis, mainly focusing on the determination of food safety and quality as required by the food industry. The book is appropriate for researchers and practitioners in food science, safety, quality, and analysis, agricultural engineering and biological systems engineering.

Hardback | 388 pages | 9781782626640 | 2017 | £169.00 | \$275.00



Steviol Glycosides

Analysis and Applications of Stevia

Ursula Wölwer-Rieck Friedrich-Wilhelms-Universität Bonn, Germany

The visibility of the plant *Stevia rebaudiana* has increased in the last few years due to its sweet constituents called steviol glycosides. As they were approved all over the world as food additives in the category sweetener, they received more attention and their use in food has increased significantly. This book presents some of the new techniques for growing Stevia which have resulted in varieties with interesting steviol glycoside profiles, new techniques to analyse the content of sweeteners in different matrices, the use of the sweeteners in new food formulations and last but not least totally new manufacturing methods to produce well tasting sweeteners. Unique in the breadth of information presented, this book will appeal food scientists, analytical chemists and health professionals.

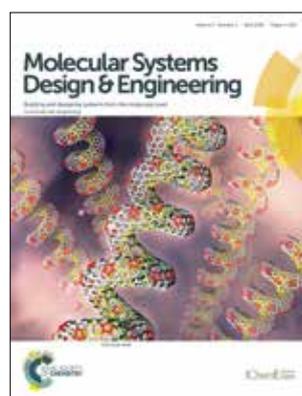
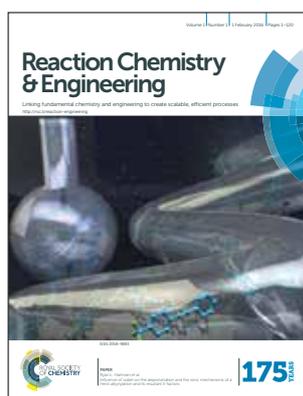
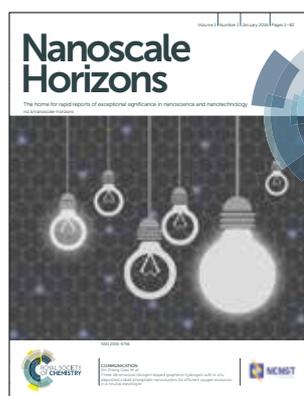
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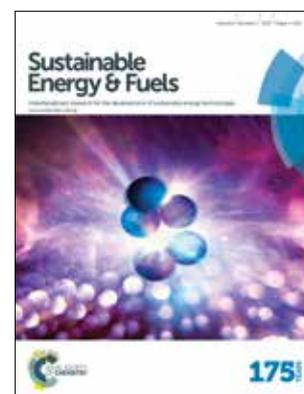
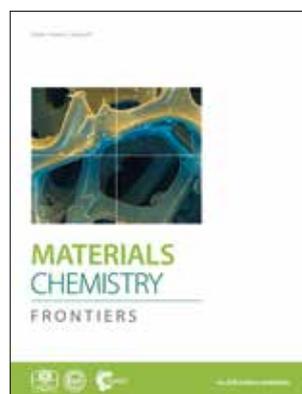
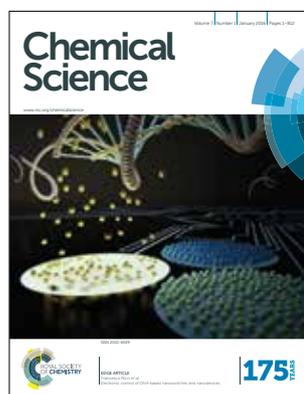
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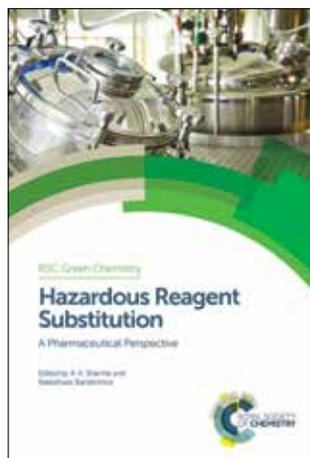


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Green Chemistry Series



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Green chemistry is one of the most important and rapidly growing fields in modern chemistry, and is widely recognised as being important across the chemical sciences, and throughout industry, education and research. This series provides high-level research books at the cutting-edge of green chemistry. The books are invaluable to industrialists, researchers and academics worldwide and anyone interested in the practical means that are being used to reduce the environmental impact of chemical processes and products.

Alternatives to Conventional Food Processing

2nd Edition

Andrew Proctor University of Arkansas, USA

Addressing alternatives to conventional food processing that have reduced energy requirements or solvent use, this second edition includes recent developments such as infrared food processing to improve food safety; pulsed electric field processing; and plasma processing. The book outlines current green technologies available to the food industry, their principles and applications, the degree to which they are already used commercially and the developments needed to further extend their use. This is an important book for researchers and industrialists working in green chemistry or food production.

Hardback | 650 pages | 9781782625186 | 2017 | £179.00 | \$300.00 

ISBN 978-1-78262-518-6



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Biobased Aerogels

Polysaccharide and Protein-based Materials

Sabu Thomas Mahatma Gandhi University, India | **Laly A Pothan** Bishop Moore College, India | **Rubie Mavelil-Sam** Bishop Moore College, India

Bringing together results on the latest research in this field, this book provides a comprehensive reviews of current developments in polysaccharide and protein based aerogels. It explores their preparation from various sources; characterisation methods; and their properties, such as surface morphology, shape recovery, mechanical properties and absorption capacities. It is an information introduction for researchers and industrialists working in chemical engineering, biomolecular chemistry and materials science.

Hardback | 550 pages | 9781782627654 | 2018 | £179.00 | \$300.00 

ISBN 978-1-78262-765-4



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Bioplastics and Biocomposites

A Practical Introduction

David Grewell Iowa State University, USA

Providing readers with a fundamental understanding of plastics and polymer processing, this book introduces bioplastics and biocomposites. Concepts covered include bioplastic processing, formulations, biocomposites, properties of biobased materials, economic evaluations of biobased materials, end of life treatment as well as environmental impacts of biobased materials. This book is ideal for researchers new to this field looking for a solid understanding in the materials science, processing and social and economic impacts of bioplastics.

Hardback | 250 pages | 9781782626565 | 2018 | £149.00 | \$245.00 

ISBN 978-1-78262-656-5



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Green Chemistry Series

Continuous Flow Reactors**From an Emerging Tool to a Mainstream Technology**

Charlotte Wiles Chemtrix BV, The Netherlands

From the perspective of a synthetic organic chemist, this book looks at the advantages and challenges associated with the development of continuous flow processes for both reactions and downstream processing. With rapid growth in interest within the field of continuous flow reactions, this book provides readers with a one-stop resource on new trends and techniques. Where possible, industrial examples of the technologies implementation is also given. This book is of interest to practising chemists and researchers as well as graduate students new to this field.

Hardback | 250 pages | 9781849739245 | 2017 | £149.00 | \$245.00 **Fast Pyrolysis of Biomass****Advances in Technology**

Robert C Brown Iowa State University, USA | Kaige Wang RTI International, USA

Fast pyrolysis and related catalytic pyrolysis are of increasing interest as pathways to advanced drop-in biofuels. This book explores several unresolved, and sometimes controversial, questions about the thermal deconstruction of biomass under conditions of fast pyrolysis and catalytic pyrolysis. It is ideal for researchers and industrialists working in pyrolysis and biofuels, this book stimulates discussion on the various competing theories of thermal deconstruction of plant polymers.

Hardback | 250 pages | 9781782626183 | 2018 | £149.00 | \$245.00 **Hazardous Reagent Substitution****A Pharmaceutical Perspective**

Rakesh Kumar Sharma University of Delhi, India | Rakeshwar Bandichhor Dr Reddy's Laboratories Ltd, India

Presenting examples of drugs and their synthesis via green chemistry routes, this book shows how the pharmaceutical industry has adopted green chemistry. Chapters focus on drug design, engineering, process development, calculations to account for waste and the challenges related to use of non-hazardous reagents. This book is of interest to industrialists working in pharmaceuticals and researchers working in green chemistry.

Hardback | 300 pages | 9781782620501 | 2017 | £159.00 | \$260.00 **Intensification of Bio-based Processes**

Andrzej Gorak Lodz University of Technology, Poland | Andrzej Stankiewicz Delft Technical University, The Netherlands

Providing a comprehensive overview of modern process intensification technologies used in bioprocessing, this book focusses on four different categories of bio-based products: bio-fuels and platform chemicals; cosmeceuticals; food products; and polymers and advanced materials. Each section covers various intensification aspects of the processes concerned, including (bio)reactor intensification; intensification of separation, recovery and formulation operations; and process integration. This is an invaluable source of information for researchers and industrialists working in chemical engineering, biotechnology and process engineering.

Hardback | 350 pages | 9781782628552 | 2018 | £169.00 | \$275.00 

Green Chemistry Series

Soy Protein-based Blends and Composites

Visakh P M Mahatma Gandhi University, India | Lucia Helena Innocentini Mei State University of Campinas, Brazil

Discussing the preparation, characterisation and application of soy protein-based blends and composites, this book different types of polymer matrixes, such as thermoplastics, thermoset, natural rubbers and synthetic rubbers. The book is an essential reference for researchers working on natural polymers as well as a valuable resource for those new to the area and interested in the materials applications.

Hardback | 400 pages | 9781782628408 | 2017 | £179.00 | \$300.00 



Sustainable Solvents

Perspectives from Research, Business and International Policy

James H Clark University of York, UK | Andrew Hunt University of York, UK | Corrado Topi University of York, UK | Giulia Paggiola University of York, UK | James Sherwood University of York, UK

Covering the life cycle of a solvent, from production through supply-chain and to downstream use and end-of-life treatment, this book highlights the challenges faced during each phase and the potential benefits that a green chemistry and bio-based economy approach could bring. Featuring case studies and perspectives from different sectors, the book is of interest to industrialists and researchers wanting to gain a broader understanding of solvent use.

Hardback | 300 pages | 9781782623359 | 2017 | £149.00 | \$245.00 



Sustainable Synthesis of Pharmaceuticals

Using Transition Metal Complexes as Catalysts

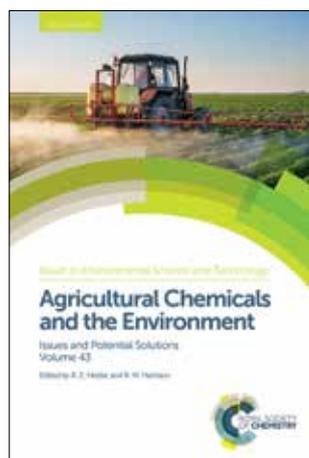
Mariette M Pereira University of Coimbra, Portugal | Mario J F Calvete University of Coimbra, Portugal

There is a growing interest in the development of sustainable processes for the synthesis of pharmaceuticals and this book bridges the divide between industrial examples and the fundamental chemistry. It explains the basic principles of using transition metal catalysis with several green approaches for the synthesis of pharmaceuticals. Written by leading experts in the field, it provides a valuable and easy tool for scientists and industrialists who require information regarding this topic.

Hardback | 260 pages | 9781782629344 | 2018 | £159.00 | \$260.00 



Issues in Environmental Science and Technology



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Coal in the 21st Century

Energy Needs, Chemicals and Environmental Controls

R E Hester University of York, UK | **R M Harrison** University of Birmingham, UK

Coal has been the fastest growing energy resource in recent years, especially in developing nations where demand for electricity is growing rapidly. This book examines the impacts that the ongoing mining and burning of coal is having on our environment. It is an important reference for students studying energy and the environment; researchers and industrialists working in energy; and policy-makers involved in the regulations surrounding energy and the environment.

Hardback | 200 pages | 9781782628606 | 2018 | £70.00 | \$115.00 



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Environmental Impacts of Road Vehicles

Past, Present and Future

R M Harrison University of Birmingham, UK | **R E Hester** University of York, UK

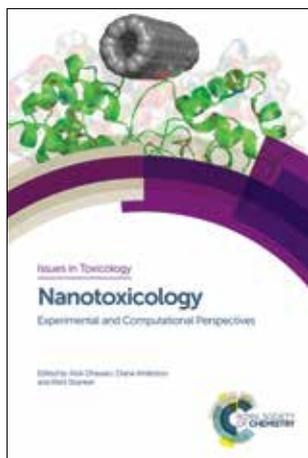
Exploring the impacts road vehicles have on the environment and on human health, this book takes in a broad range of topics. Chapters cover air pollution, pollution of soil and water, and noise pollution. The book also looks at car batteries, and the life cycle of a car, from production to disposal. The book gives a complete picture of the impacts of road vehicles, and is a must-read for anyone interested in pollution and the environment.

Hardback | 250 pages | 9781782628927 | 2017 | £70.00 | \$115.00 



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Issues in Toxicology



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ISSN: 1757-7179

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The field of toxicological research is continually expanding and diversifying, driven by the need to understand the human and ecological risks of exposure to chemicals and other toxicants. This series is devoted to coverage of modern toxicology and assessment of risk. Written by expert scientists from academia, government and industry, each book will serve as a guide to investigations in toxicology, biomedicine, biochemistry, forensics and environmental and pollution sciences.

Big Data in Predictive Toxicology

Daniel Neagu University of Bradford, UK | **Andrea-Nicole Richarz** European Commission - Joint Research Centre, Italy

The rate and volume of toxicological data generation is continually growing due to novel techniques and software. The amplified pace and capacity of data generation has repercussions for organising and analysing data output. This book discusses these challenges as well as the nature, storage, analysis and interpretation of toxicological big data. It details how these data are applied in toxicity prediction, modelling and risk assessment. This title is relevant for researchers and postgraduates in the fields of computer methods, applied and physical chemistry, safety and hazard assessment, cell and molecular biology, medicinal and pharmaceutical toxicology, predictive toxicology, and data science.

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Chemical Health Threats

Assessing and Alerting

Raquel Duarte-Davidson Public Health England, UK | **Rob Orford** Public Health England, UK | **Stacey Wyke** Public Health England, UK

This book covers recent developments in the implementation of a European collaboration for assessing cross-border toxicological threats. It discusses the European guidelines for the risk assessment and management of serious international public health dangers. It covers REACH (Registration, Evaluation, Authorisation & Restriction of Chemicals) directives and the work of the ASHT (Alerting System for Chemical Health Threats) project. It will be useful for to public health regulators, toxicologists, poisons centres, industrialists and COSHH (Control of Substances Hazardous to Health) specialists.

Hardback | 400 pages | 9781782620716 | 2018 | £179.00 | \$300.00



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Issues in Toxicology

Ecotoxicology and Genotoxicology

Non-traditional Terrestrial Models

Marcelo L Larramendy National University of La Plata, Argentina

The potential impact of pollutants such as agrochemicals on the environment is of global concern. Increasing anthropogenic use of these compounds can result in contamination of food, water and atmospheric systems and in order to combat this pollution it is important to be able to accurately monitor the long term effects. This book describes the latest non-traditional terrestrial species models used as indicators of the effects of environmental pollutants.

Hardback | 300 pages | 9781782628118 | 2017 | £159.00 | \$260.00 



Ecotoxicology and Genotoxicology

Non-traditional Aquatic Models

Marcelo L Larramendy National University of La Plata, Argentina

The potential impact of pollutants such as agrochemicals on the environment is of global concern. Increasing anthropogenic use of these compounds can result in contamination of food, water and atmospheric systems and in order to combat this pollution it is important to be able to accurately monitor the long term effects. This book describes the latest non-traditional aquatic species models used as indicators of the effects of environmental pollutants.

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Formaldehyde

Exposure, Toxicity and Health Effects

Luoping Zhang University of California Berkeley, USA

Formaldehyde is virtually ubiquitous in the modern environment due to its cost-effective nature, its use in resin formation, and its preservative properties. Though formaldehyde is necessary for many products and processes important to the world's economy, this economic dependence on formaldehyde comes at a cost to public health. Scientific inquiry into formaldehyde exposure has grown in response to this public health problem. This book consolidates these developments and will be a valuable source of information for postgraduates and researchers in environmental and occupational exposure as well as regulators.

Hardback | 250 pages | 9781782629733 | 2017 | £149.00 | \$245.00 



Nanotoxicology

Experimental and Computational Perspectives

Alok Dhawan Indian Institute of Toxicology Research (CSIR-IITR), India | Diana Anderson University of Bradford, UK | Rishi Shanker Ahmedabad University, India and Michigan State University, USA

This book addresses the gaps relating to health and safety issues of this field and aims to bring together fragmented knowledge on nanosafety. Not only do chapters address conventional toxicity issues, but also more recent developments such as food borne nanoparticles, life cycle analysis of nanoparticles and nano ethics. In particular this book presents a unique compilation of experimental and computational perspectives. The book is aimed towards postgraduates, academics, and practicing industry professionals but also serves as an excellent foundation for researchers new to nanotechnology and nanotoxicology.

Hardback | 500 pages | 9781782621584 | 2017 | £179.00 | \$300.00 



Issues in Toxicology

Oxidative Stress and Redox Signalling in Parkinson's Disease

Rodrigo Franco University of Nebraska-Lincoln, USA | Jonathan Doorn University of Iowa, USA | Jean-Christophe Rochet Purdue University, USA

Parkinson's disease is the second most common neurodegenerative disorder affecting millions of people worldwide. In order to find neuroprotective strategies, the mechanisms of the disease need to be understood, and there have been links made between oxidative damage and Parkinson's disease. This book provides a thorough review of the latest research developments regarding the mechanisms by which oxidative stress and redox signalling mediate Parkinson's disease. It is designed to cover basic knowledge regarding oxidative stress and redox signalling, Parkinson's disease, and neurodegeneration, while also exploring in detail the latest advancement in the research field. Topics covered will include dopamine metabolism, metal homeostasis and DNA-damage. The text will also discuss the current advance in the identification of potential biomarkers for diagnosis and disease progression and the future of antioxidant based therapeutics. Written by recognised experts in the field this book will be a great source of information for postgraduate students and academics, clinicians, toxicologists and risk assessment groups.

Hardback | 500 pages | 9781782621881 | 2017 | £179.00 | \$300.00 

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Regulatory Toxicology in the European Union

Tim Marrs Edentox Associates, UK | Kevin Woodward TSGE Consulting Limited, UK

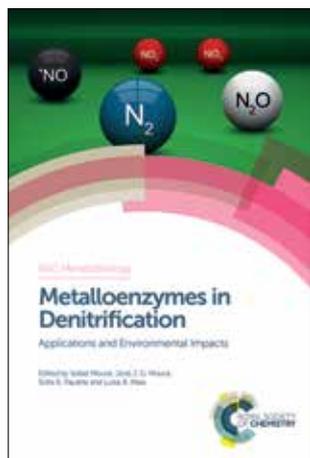
Consumer and environmental protection depends on the careful regulation of all classes of chemicals. Toxicology is the key science used to evaluate safety and so underpins regulatory decisions on chemicals. This book is the first to cover regulatory toxicology in Europe and addresses the need for a wider understanding of the principles of regulatory toxicology and their application. It will be an essential reference to regulatory authorities, industry, and toxicologists working across the European Union and for those based in other countries trying to understand and comply with European Union regulations.

Hardback | 500 pages | 9781782620662 | 2017 | £179.00 | \$300.00 

ISBN 978-1-78262-066-2



Metallobiology



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ISSN: 2045-547X

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The Metallobiology series is a collection of professional reference books covering all aspects of the roles of metals in biological systems. The scope includes metalloenzymes, metalloproteins, storage and transport of metal ions, bio-organometallic chemistry and interaction of metal ions with biomolecules. Books in this series provide authoritative perspectives from international experts and will be of interest to both academics and those working in industry in a wide range of disciplines, including medicinal chemistry, pharmaceutical science, biochemistry, metallomics and inorganic biochemistry.

Metallomics

Principles and Applications

Hongzhe Sun University of Hong Kong, Hong Kong

The rapidly developing and interdisciplinary field of metallomics falls at the frontiers of bioinorganic and bioanalytical chemistry. This book provides a comprehensive account from basic concepts and principles to applications of metallomics in biomedical and environmental sciences. It covers a range of cell types and the arsenal of bioanalytical tools used in the field. Written and edited by leading experts in the field, this book provides a useful resource for postgraduate students, biochemists, bioanalytical chemists and environmental scientists.

Hardback | 350 pages | 9781782624509 | 2017 | £169.00 | \$275.00 

ISBN 978-1-78262-450-9



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The Biological Chemistry of Nickel

Henryk Kozłowski University of Wrocław, Poland | **Deborah Zamble** University of Toronto, Canada | **Magdalena Rowińska-Żyrek** University of Wrocław, Poland

Nickel is an essential element in many biochemical processes and there has been significant recent research into understanding the role this transition element plays. This book discusses a range of key topics in this field including the coordination chemistry of nickel-containing biomolecules, current theories on nickel-containing enzymes and the transport, storage and transcriptional regulation of nickel in biological systems. An essential text for biochemists, biologists and medicinal chemists, this book provides a comprehensive review of the latest findings in nickel biology and chemistry.

Hardback | 250 pages | 9781782624981 | 2017 | £159.00 | \$260.00 

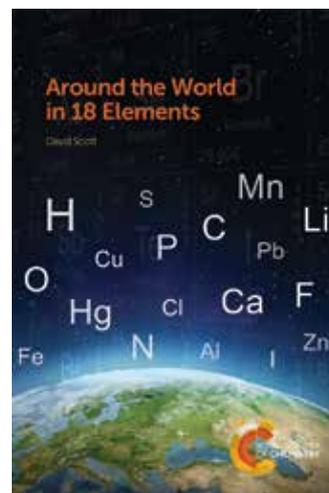
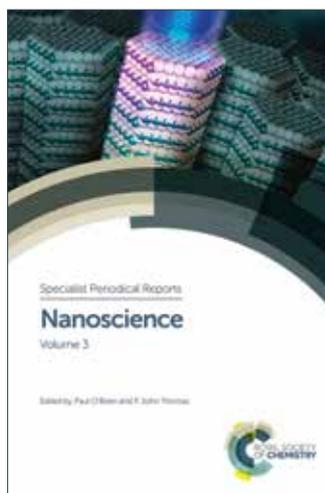
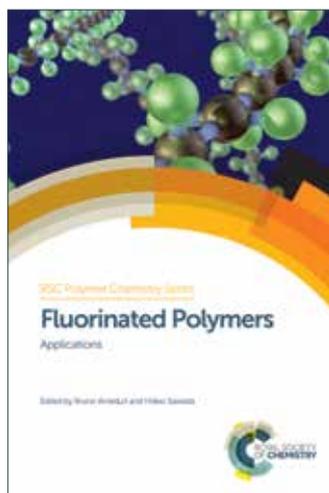
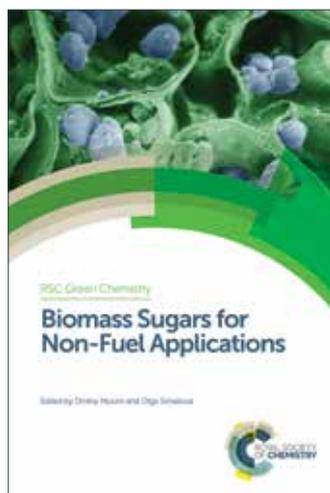
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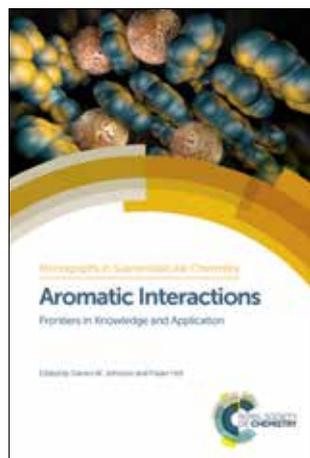
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Monographs in Supramolecular Chemistry



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Supramolecular chemistry concerns the structure and function of molecular assemblies formed through weak interactions. These complexes have found diverse applications in materials chemistry, nanoscience, catalysis, food sciences, and medicine, and this has led to a rapid expansion in supramolecular chemistry research. With contributions from high profile international scientists working within the field, each book in the series covers a key concept for graduate level students and above interested in supramolecular chemistry and its diverse applications. The books are ideal for reference and as state-of-the-art guides, and they aim to enable further developments of new applications through an understanding of the fundamentals and a comprehensive overview of the latest research.

Beyond Chemical Topology

Tangles, Weavings and Ravels

Charlotte Bonneau Kingston University London, UK | **Toen Castle** University of Pennsylvania, USA | **Myfanwy Evans** Technische Universität Berlin, Germany | **Stephen Hyde** Australian National University, Australia

Structural entanglement in molecular graphs and nets is relevant to many chemical materials, from fullerenes to DNA complexes. This book explores the concepts of two-dimensional topology, geometry, and reticulations of surfaces of varying topology as a means to generate and describe tangled structures. Orbifolds, knot theory and chirality are discussed as modern approaches to symmetry, concepts that were pioneered by the authors of this new book. The book maintains a focus on the latest chemical applications throughout.

Hardback | 300 pages | 9781782626480 | 2017 | £159.00 | \$260.00 



Functional Supramolecular Materials

From Surfaces to MOFs

Rahul Banerjee CSIR-National Chemical Laboratory, India

Supramolecular materials have a great number of applications due to the reversibility of their non-covalent molecular interactions, such as reversible hydrogen bonding, host-guest interactions and electrostatic interactions. This book provides a comprehensive source of information on the structure, function and novel applications of organic and metal-organic supramolecular materials. Written by international experts in their fields, this book will be of interest to students and researchers in academia and industry in the areas of supramolecular chemistry and functional materials science.

Hardback | 350 pages | 9781782625407 | 2017 | £169.00 | \$275.00 



Supramolecular Amphiphiles

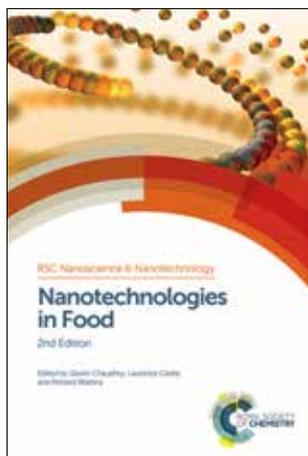
Xi Zhang Tsinghua University, China

Supramolecular amphiphiles are one of the most important emerging species in supramolecular chemistry. Because they employ of non-covalent interactions, these species demonstrate adaptability and reversibility in conformational transformation, making them important in bridging the gap between molecular architecture and functional assembly. This book provides a detailed and systematic overview of the history, development and future perspectives of supramolecular amphiphiles and will benefit both students new to this field and experienced researchers wanting to explore the wider context of their work.

Hardback | 250 pages | 9781782625421 | 2017 | £149.00 | \$245.00 



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The possible uses of nanotechnology span many fields from energy to health; as a result there is a wealth of scientific nanoscience research taking place all over the world. When there is so much information available on the topic, it can be difficult to get a complete overview of the latest developments. The Nanoscience & Nanotechnology Series provides a comprehensive resource of books covering key topics such as the characterisation, performance and properties of nanostructured materials and technologies and their applications. With contributions from leading experts in nanoscale research, the books are suitable for graduate student level and above in chemistry, materials science, engineering, biology and physics wanting to know more about nanoscience.

Bionanodesign

2nd Edition

Maxim Ryadnov National Physical Laboratory, UK

Bionanodesign has been fully revised and updated to bring together contemporary approaches for designing nanostructures that employ naturally derived self-assembling motifs as synthetic platforms. The overall aim is to compile the existing understanding of rules that govern biomolecular self-assembly into a practical guide to molecular nanotechnology. Written by a world recognised expert, this book provides an authoritative guide to those working in design and development of nanomaterial research in industry and academia, from postgraduate researcher upwards.

Hardback | 250 pages | 9781782628163 | 2017 | £159.00 | \$260.00 



Diatom Nanotechnology

Dusan Losic University of Adelaide, Australia

Diatoms, single algae cells, are gaining much interest in nanoscience due to their distinctive porous silica structure and properties. The proposed book is the first book published on diatom nanotechnology providing the most comprehensive overview in this field from international leading experts. The book covers the unique porous silica structure of diatoms, the mechanism of their formation, properties and the broad range of applications in nanotechnology including nanofabrication, optical biosensors, gas sensors, water purifications, photonics, drug delivery, batteries, solar cells, supercapacitors, new adsorbents and composite materials.

Hardback | 500 pages | 9781782629320 | 2018 | £179.00 | \$300.00 



Fabrication and Applications of ZnO Nanostructures

Yue Zhang University of Science and Technology Beijing, China

The book presents the recent progresses in ZnO based nanostructures and nanodevices, such as properties modulation of ZnO nanomaterials and new types of devices. Authored by a leading researcher working within the field, this book is suitable for those working in nanostructure fabrication and device application in industry and academia and is appropriate from advanced undergraduate level upwards.

Hardback | 250 pages | 9781782627418 | 2017 | £123.00 | \$205.00 



Nanoscience & Nanotechnology Series

Nanostructured Materials for Type III Photovoltaics

Peter Skabara University of Strathclyde, UK | **Mohammad Azad Malik** University of Manchester, UK

Materials for Type III solar cells have branched into a series of generic groups, including organic 'small molecule' and polymer conjugated structures, fullerenes, quantum dots, hybrid organic/inorganic composites and perovskites. This book will give a collective insight into the different roles that nanostructured materials play in Type III solar cells. This will be an essential text for those working in materials science and technology, providing a fundamental understanding and appreciation of the potential and challenges associated with each of these technologies.

Hardback | 300 pages | 9781782624585 | 2017 | £159.00 | \$260.00 



Nanotechnologies in Food

2nd Edition

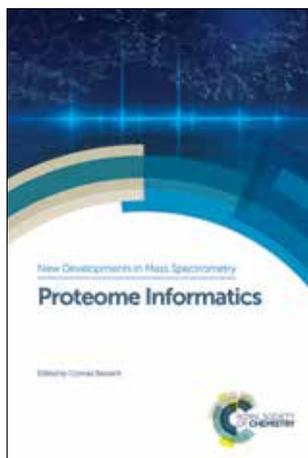
Qasim Chaudhry University of Chester, UK | **Laurence Castle** DEFRA Central Science Laboratory, UK | **Richard Watkins** DEFRA, UK

This book provides an overview of the products and applications of nanotechnologies in agri-food and related sectors. Following on from the success of the first edition, this new edition has been revised and updated to bring the reader fully up-to-date on the emerging technological, societal, and policy and regulatory aspects in relation to nanotechnologies in food. The book is a source of much needed information on the products and applications of nanotechnology for the food sector - for scientists, regulators, and consumers alike.

Hardback | 325 pages | 9781782621713 | 2017 | £159.00 | \$260.00 



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Examining instrument and method development and new applications of mass spectrometry, this series is an important resource for graduate students, researchers and analytical chemists interested in the respective instrumentation and techniques. The books present the key facts and concepts in a concise and readable manner to keep readers up-to-date with the latest information and to promote the practice of mass spectrometry techniques.

Mass Spectrometric Characterisation of Lignin and Related Compounds

New Techniques

Joseph Banoub Memorial University of Newfoundland, Canada

Devoted to highlighting mass spectrometry and tandem mass spectrometry techniques used for the elucidation of the chemical structure of lignin, this unique book sheds new light on the research in this area. Specific pertinent examples are presented that highlight the key role of the state-of-the-art mass spectrometry methods that employ softer ionization modes to analyse the structure of native and modified types of lignin. Providing an overview and critique of the current understanding of lignin structure, it takes into account the various extraction methodologies that have been employed. In addition, it emphasizes how these various aspects have contributed to the current knowledge of the structure of lignins. This book is useful for mass spectrometry researchers and other analytical chemists interested in biopolymers and also those in bio-fuels laboratories.

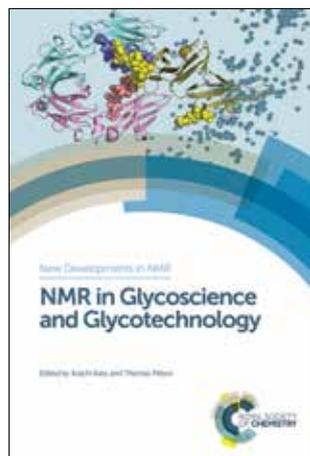
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New Developments in NMR



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Focusing on novel aspects of method and instrumentation development, applications in emerging fields and new techniques and technologies, this series documents the important advances being made in this field. The books provide comprehensive introductions to the relevant theory to facilitate greater understanding and to encourage wider usage of NMR techniques, making them ideal for students, researchers and practising analytical scientists, as well as manufacturers with an interest in the instrumentation.

Contrast Agents for MRI

Physical Methods

Valérie C. Pierre University of Minnesota, USA | **Matthew J Allen** Wayne State University, USA

As a practical reference guide for designing and performing experiments, this book focuses on the five most common classes of contrast agents for MRI and describes how to characterise and evaluate them. For each class of contrast agents, a description of the theory behind their mechanisms is discussed briefly to orient the new reader. Then detailed subchapters discuss the different physical chemistry methods used to characterise each class of contrast agents in terms of their efficacy, safety and in vivo behaviour and their performance. The editors and contributors are at the forefront of research in the field of MRI contrast agents and this unique book is a timely addition to the literature in this area.

Hardback | 400 pages | 9781782624479 | 2017 | £179.00 | \$300.00 



Cross-relaxation and Cross-correlation Parameters in NMR

Molecular Approaches

Daniel Canet Universite de Lorraine, France

Spin relaxation parameters, although difficult to interpret, are attracting interest in NMR as these parameters are capable of yielding both structural and dynamic information. For example, contrast in MRI is obtained through spin relaxation of the water protons in biological tissues. Cross-relaxation and cross-correlation parameters afford a non-ambiguous approach to molecular structure and dynamics although they require some special skills for their experimental determination and for their exploitation. This work will provide a detailed account of cross-relaxation and cross-correlation which would be timely and fill a gap in the present NMR literature for the analytical scientist.

Hardback | 320 pages | 9781849739139 | 2017 | £159.00 | \$260.00 



New Developments in NMR

Modern Methods in Solid-State NMR

A Practitioner's Guide

Paul Hodgkinson Durham University, UK

Solid-state NMR has reached the point where the basic techniques are easily accessible and increasingly viewed as a standard analytical tool. There is, however, a vast array of experiments and analyses that are potentially challenging for a non-expert to exploit effectively. This volume focuses on "practical aspects", ie where experts in a particular experimental or analytical method illustrate what questions can and can't be addressed by the technique, and common pitfalls. Aimed at researchers starting in this field, this book is the equivalent of spending time in a different laboratory learning what they did and all the hints and tricks that make the difference between knowing about a technique and feeling comfortable giving it a go.

Hardback | 250 pages | 9781782628545 | 2017 | £149.00 | \$245.00 



Non-conventional NMR Detection Methods

Xin Zhou Wuhan Institute of Physics and Mathematics (WIPM), China

NMR and MRI have been applied to various disciplines, but the sensitivity of NMR is intrinsically lower comparing to other analytical or imaging methods. This has caused many non-conventional developments looking at improving NMR sensitivity, such as SQUID (Superconducting QUantum Interference Device), atomic magnetometer, MRFM (Magnetic Resonance Force Microscopy) and remote detection. The NMR detection threshold has been largely boosted by these methods, resulting in the emergence of novel applications. This book will describe the recent advances in non-conventional NMR detection methods and their applications, and also summarise the challenges facing the next generation of users. Aimed at both academia and industry, readers should buy this publication to broaden their knowledge beyond conventional NMR.

Hardback | 480 pages | 9781849739061 | 2017 | £179.00 | \$300.00 



NMR in Glycoscience and Glycotechnology

Koichi Kato National Institutes of Natural Sciences, Japan | Thomas Peters University of Luebeck, Germany

Focusing on solution and solid-state NMR of carbohydrates, glycoproteins, glyco-technologies, biomass and related topics which will have significant impact on the development of therapeutic agents eg vaccines, this volume is timely and useful not only for NMR specialists but also for a broader scientific community. The precise analysis of glycosylation patterns in humans can be used in therapies of utmost importance. However, the complexity and heterogeneity of dynamic glycan structures often discouraged researchers from actively challenging and addressing this important issue. Written by leading experts in the field, this book is an important contribution to the literature in this area for a wide spectrum of readers.

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NMR-based Metabolomics

Hector C Keun Imperial College London, UK

In this rapidly growing field, a comprehensive book describing the state of the art in the application of NMR spectroscopy to metabolomics will easily find a home. Directed at the metabolomics community, this book will be unique in providing background knowledge, resources, instrumental platforms and software. It will introduce relevant theory to the researcher as well as serve as a practical guide detailing key experiments and data handling procedures. Information available on common sample types will be described together with reference to the latest web-based resources available. Application-specific considerations will be discussed for a wide range of research topics.

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New Developments in NMR

Optimizing NMR Methods for Structure Elucidation

Characterizing Natural Products and Other Organic Compounds

Darcy Burns University of Toronto, Canada | William F Reynolds University of Toronto, Canada

This book is aimed at informing organic chemists and natural products chemists on the use of NMR for structure elucidation to enable them to ensure they yield the most reliable possible data in the minimum possible time. It covers the latest pulse sequences, acquisition and processing methods, practical areas not covered in most texts eg detailed consideration of the relative advantages and disadvantages of different pulse sequences, choosing acquisition and processing parameters to get the best possible data in the least possible time, pitfalls to avoid and how to minimize the risks of getting wrong structures. Useful in industrial, pharma or research environments, this reference book is for anyone involved with organic chemistry research and, in particular, natural products research requiring advice for getting the best results from the NMR facilities.

Hardback | 250 pages | 9781782625391 | 2017 | £159.00 | \$260.00



ISBN 978-1-78262-539-1



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Practical NMR for Oil and Gas Exploration

Lizhi Xiao China University of Petroleum, Beijing, China

Describing comprehensively the development and applications of NMR to oil and gas exploration, this book will bring the literature up to date as it has developed very quickly in the last two decades. Outlining new methodologies, it will provide a thorough and comprehensive document enabling a better understanding of the basics of NMR physics, petrophysics, downhole tools and raw data. This book is designed to meet the needs of the community and encourage applications in low field NMR. The author has more than 30 years' experience in this hot and important topic.

Hardback | 600 pages | 9781849739160 | 2017 | £179.00 | \$300.00

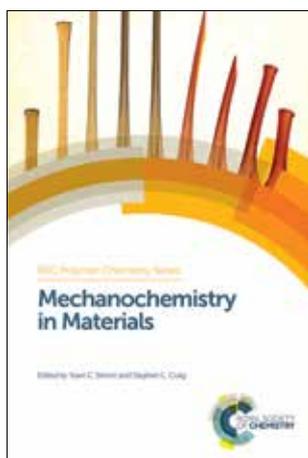


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Polymer Chemistry Series



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Tackling Global Challenges

Alaa Abd-El-Aziz University of Prince Edward Island, Canada | **Christian Agatemor** University of Prince Edward Island, Canada | **Wai-Yeung Wong** Hong Kong Baptist University, Hong Kong

New materials are required to solve global challenges such as the growing energy demand and reducing the threat of new and re-emerging diseases and infections. Metallopolymers is an exciting and promising area of research and this book focuses on the strategy of incorporating transition metals into macromolecules to design functional materials for addressing such problems. The book appeals to those interested in polymer chemistry, organometallic chemistry and materials science as well as the applications of the materials for example optoelectronic systems, sensors, energy harvesting and biomedical research.

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Mechanochemistry in materials science has experienced tremendous growth in the last five years and has developed to become one of the most important topics in polymer science today. With a particular focus on polymers and soft materials the book discusses experimental and theoretical considerations. Appealing to a broad range of materials scientists, working in industry and academia, this well-presented and comprehensive title will be essential reading for postgraduate researchers upwards.

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Polymer Chemistry Series

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Ashok Kakkar McGill University, Canada

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Molecularly Imprinted Polymers for Analytical Chemistry Applications

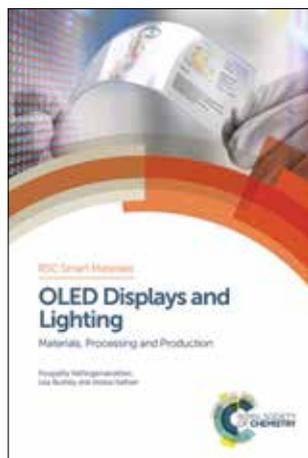
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There is great interest in the preparation and application of synthetic receptor-based recognition units for chemical sensors. The book summarizes the latest developments and applications of molecular imprinting for selective chemical sensing. Specific chapters include: designing of molecular cavities aided by computational modelling, application of molecularly imprinted polymers (MIPs) for separation as well as sensing of pharmaceuticals and nucleotides. The book is suitable for analytical and biomedical scientists as well as polymer and materials scientists.

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Laser Processing of Materials for Medical Applications

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The use of lasers to process materials for medical applications has steadily grown over the past decade. Lasers are finding significant academic and industrial use for coating, machining, melting, polymerising, sintering, and welding materials that are used to restore normal physiologic activity. This book provides the first overview of laser materials for medical applications and will be beneficial to materials and manufacturing engineers, biological, computer and physical scientists looking for an overview of the developments in this area.

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Applications in Catalysis and Life Sciences

Stefan H. Bossmann Kansas State University, USA | **Hongwang Wang** Kansas State University, USA

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Smart Materials Series

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Arti Vashist Florida International University, USA | **Ajeet K Kaushik** Florida International University, USA | **Sharif Ahmad** Jamia Millia Islamia, India | **Madhavan Nair** Florida International University, USA

This first book provides a comprehensive overview of nanogels and their applications in nanomedicine. Each individual chapter will explore a different application of nanogels including drug delivery, diagnostics and therapeutics, tissue engineering and imaging. The content will also cover synthesis methods and characterization techniques for the different nanogels. The book will appeal to biologists, chemists, and nanotechnologists interested in translation research for personalized nanomedicine for health care.

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OLED and QLED Displays and Lighting

Materials, Processing and Production

Poopathy Kathirgamanathan Brunel University, UK | **Arokia Nathan** University of Cambridge, UK

Organic light-emitting diodes (OLEDs) and quantum dot light emitting diodes (QLEDs) are devices which emit light in response to an electric current and used to produce digital displays. They have attracted attention due to their uses in television screens, computer/laptop monitors and mobile phones. This book is written by eminent scientists who have a direct knowledge of all the issues involved in OLED and QLEDs, and therefore gives a complete picture of the subject for the advanced undergraduate/post graduate level.

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Reactive Inkjet Printing

A Chemical Synthesis Tool

Patrick J Smith University of Sheffield, UK | **Aoife Morrin** Dublin City University, Ireland

Edited by two leading experts, the book describes the use of inkjet printing as a chemical synthesis tool in which an inkjet printer dispenses one or more reactants to form a product *in-situ*. The book is suitable for advanced undergraduates, graduates and researchers in materials science, specifically those interested in tissue engineering, materials synthesis and additive manufacture.

Hardback | 250 pages | 9781782627678 | 2017 | £149.00 | \$245.00 



Smart Ionic Liquids

Ali Eftekhari Ulster University, UK

The use of ionic liquids as a monomer for polymers is a rapidly emerging field providing many applications as smart materials including ionic electromechanically actuators, shape-memory gels and responsive hydrogels, electrochromic devices and drug delivery. This book provides the first comprehensive overview of the applications of ionic liquids as smart materials. The book is aimed at researchers and students in materials science, polymer science, chemistry and physics interested in the applications of the materials.

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Smart Materials Series

Smart Materials for Tissue Engineering

Applications

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In the last couple of decades, research in the area of tissue engineering has witnessed tremendous progress. Research has been aimed towards replacing or facilitating the regeneration of damaged or diseased cell, tissue or organs by applying a biomaterial support system, and a combination of cells and bioactive molecules. Following on from the first volume, Smart Materials for Tissue Engineering: Fundamental Principles, this book comprehensively covers the applications of smart materials providing a valuable resource for biochemists, materials scientists and biomedical engineers working in industry and academia.

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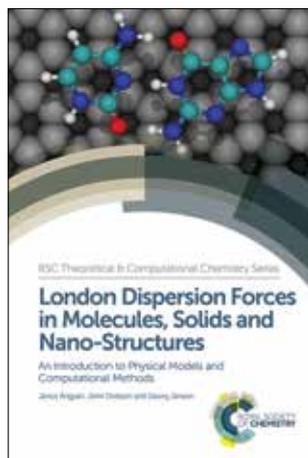
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Providing an overview of current understanding of the physical origin and modelling of London dispersion forces manifested at an atomic level, this book provides theoretical, physical and synthetic chemists, as well as solid-state physicists, with a systematic understanding of the origins and consequences of these ubiquitous interactions. It covers a wide range of system, from small intermolecular complexes, to organic molecules and crystalline solids, through to biological macromolecules and nanostructures.

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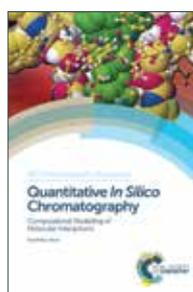
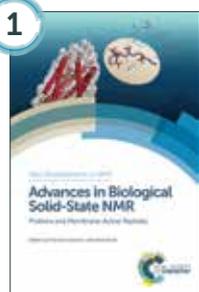
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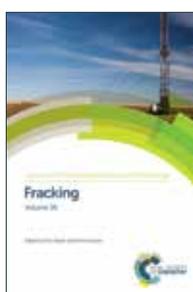
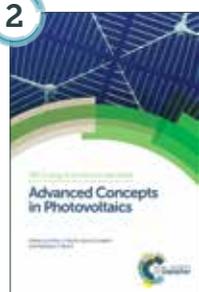
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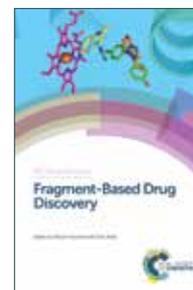
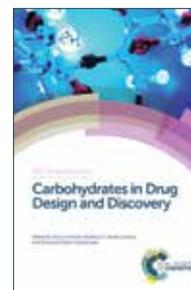
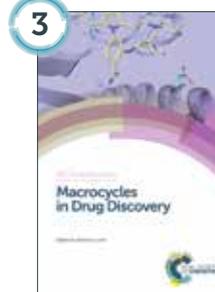
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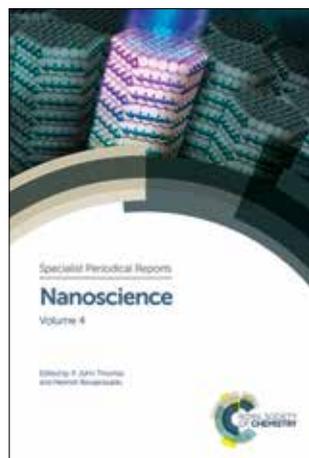
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Volume 42

Maxim Ryadnov National Physical Laboratory, UK | Ferenc Hudecz Eötvös Loránd University, Hungary

Amino Acids, Peptides and Proteins comprises a comprehensive and critical review of significant developments at the biology/chemistry interface. Compiled by leading researchers in their subject, this volume incorporates current trends and emerging areas. Appealing broadly to researchers in academia and industry, it will be of great benefit to any researcher wanting a succinct reference in the field.

Hardback | 250 pages | 9781788010023 | 2018 | £314.95 | \$505.00 



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Volume 43

Amelia Pilar Rauter Universidade de Lisboa, Portugal | Thisbe Lindhorst Kiel University, Germany | Yves Queneau INSA Lyon, France

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Volume 29

James Spivey Louisiana State University, USA | K M Dooley Louisiana State University, USA | Yi-Fan Han East China University of Science and Technology, China

Catalysts are required for a variety of applications and industrialists and academics are increasingly challenged to find cost effective and environmentally benign catalysts to use. This volume looks at modern approaches to catalysis and reviews the extensive literature on areas such as electrochemical promotion of catalysis, biodiesel-based metals on emission control devices, deoxygenation of fatty acids and transitioning rationally designed catalytic materials to real world catalysts produced on a commercial scale.

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Michael Springborg University of Saarland, Germany | **Jan-Ole Joswig** Dresden University of Technology, Germany

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Hardback | 300 pages | 9781788010047 | 2018 | £314.95 | \$505.00 



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Volume 14

Craig Banks Manchester Metropolitan University, UK | **Steven McIntosh** Lehigh University, USA

Providing the reader with an up to date digest of the most important research currently carried out in the field, Electrochemistry Volume 14 is compiled and written by leading experts from across the globe. Coverage includes chapters on the use of metal organic frameworks as a precursor for electrocatalytic centre supports to enhance the oxygen reduction process in low temperature fuel cell systems, electrocatalysis for ethanol electrooxidation in alkaline media, and new polymer electrolyte and electrocatalysts for direct alcohol fuel cells. This volume is a key reference for researchers providing a timely overview of this exciting and developing area.

Hardback | 220 pages | 9781782621140 | 2017 | £314.95 | \$505.00 



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Volume 4

P John Thomas Bangor University, UK | **Neerish Revaprasadu** University of Zululand, South Africa

The field of nanoscience continues to grow at an impressive rate and, with such a vast landscape of material, careful distillation of the most important discoveries will help researchers find the key information they require. Nanoscience Volume 4 provides a critical and comprehensive assessment of the most recent research and opinion from across the globe. Coverage includes diverse topics such as 2-D nanomaterials, quantum dot solar cells and core nanoparticles for drug delivery applications. Anyone practising in any nano-allied field, or wishing to enter the nano-world will benefit from this resource, presenting the current thought and applications of nanoscience.

Hardback | 250 pages | 9781782621591 | 2017 | £314.95 | \$505.00 



Nuclear Magnetic Resonance

Volume 46

Robert Law Imperial College London

Applications of nuclear magnetic resonance span a wide range of scientific disciplines, from physics to medicine. For those wanting to become acquainted with NMR or seasoned practitioners, this is a valuable source of current methods and applications. With such rapid growth as both a technique and in its applications, this volume provides a distillation of this spectroscopic method which will be an invaluable addition to the literature.

Hardback | 300 pages | 9781782629986 | 2017 | £314.95 | \$505.00 



Specialist Periodical Reports

Organometallic Chemistry

Volume 42

Nathan Patmore University of Huddersfield, UK | **Paul Elliot** University of Huddersfield, UK

With the increase in volume, velocity and variety of information, researchers can find it difficult to keep up to date with the literature in their field. This interdisciplinary field has the potential to provide answers to problems and challenges faced in catalysis, synthetic organic chemistry and the development of therapeutic agents and new materials. Providing an invaluable volume, this volume contains analysed, evaluated and distilled information on the latest in organometallic chemistry research.

Hardback | 250 pages | 9781788010054 | 2018 | £314.95 | \$505.00 



Organophosphorus Chemistry

Volume 46

David W Allen Sheffield Hallam University, UK | **David Loakes** University of Cambridge, UK |
John C. Tebby Sheffield Hallam University, UK

Coverage in this annual review of the literature presents a comprehensive and critical survey of the vast field of study involving organophosphorus compounds, from phosphines and phosphonium salts through to phosphorus acids, nucleotides, ylides and phosphazenes. The Editors have added to the usual content with a timely chapter on the recent developments in green synthetic approaches in organophosphorus chemistry to reflect current interests in the area.

Hardback | 350 pages | 9781782629016 | 2017 | £314.95 | \$505.00 



Photochemistry

Volume 45

Angelo Albini University of Pavia, Italy | **Elisa Fasani** University of Pavia, Italy

Reviewing photo-induced processes that have relevance to a wide ranging number of academic and commercial disciplines and interests, this volume reflects the current interests in chemistry, physics, biology and technology. Essential reading for postgraduates, academics and industrialists working in the field of photochemistry, enabling them to keep on top of the literature.

Hardback | 350 pages | 9781788010061 | 2018 | £314.95 | \$505.00 



Synthetic Biology

Volume 3

Maxim Ryadnov National Physical Laboratory, UK | **Luc Brunsveld Eindhoven** University of Technology, Netherlands | **Hiroaki Suga** University of Tokyo, Japan

Synthetic biology enables the design of biological systems in a rational and systematic way. This volume captures the expanding primary literature in the form of critical and comprehensive reviews, providing the reader with an authoritative digest of the latest developments in this emerging field. Leading researchers draw on the recent literature, from both dedicated journals and broader sources, making this an essential reference to any library supporting this research.

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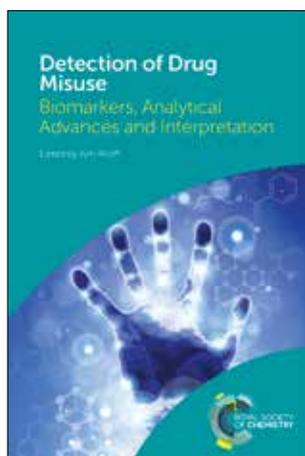
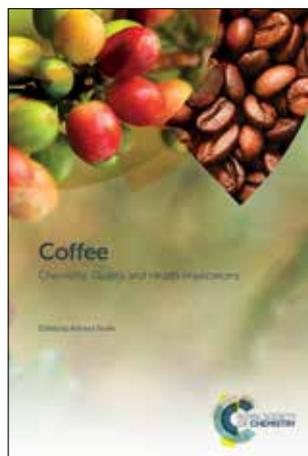
University of Warwick, UK

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Animal Genetics for Chemists

Ralph G Wilkins New Mexico State University, USA

Accounts are appearing on some facet of genetics in nearly every issue of scientific magazines and often in the daily newspapers. This book sets out to cover the fundamentals of the subject without the details in a much larger genetics text in order to provide background reading for those not studying the subject. It features humans (a lot), other mammals (a good deal) and occasionally other animals to illustrate principles. Supported with numerous figures and short vignettes, it will be useful to a wide audience from chemists, pharmacists and healthcare professionals.

Paperback | 200 pages | 9781782627609 | 2017 | £34.99 | \$56.00 



An Introduction to Ionic Liquids

2nd Edition

Jason Hallett Imperial College London, UK

Written in a clear, concise and consistent way, this textbook is a valuable introduction to ionic liquids for advanced undergraduate and graduate courses. It explores their nomenclature, history, properties and their wide ranging applications, from catalysis to electrochemistry and clean technology. This second edition covers major developments in ionic liquids science and its applications over recent years, such as the use of ionic liquids for carbon dioxide capture; biomass processing; making biofuels such as ethanol; biomedical applications including drug delivery; and surface science studies and applications including lubrication.

Hardback | 360 pages | 9781782623366 | 2017 | £49.95 | \$79.99 



Astrochemistry in the Dynamical Interstellar Medium

David A Williams University College London, UK | Thomas W Hartquist University of Leeds, UK | Jonathan C Rawlings University College London, UK | C Cecchi-Pestellini Università degli Studi di Palermo, Italy | Serena Viti University College London, UK

Astrochemistry is a well-established interdisciplinary subject. Existing astrochemical books normally describe the subject in terms of chemistry in static or slowly-varying astronomical situations but the most significant astronomical regions are those in which the physical conditions change on timescales that are comparable to or shorter than chemical timescales. This is the first book specifically devoted to the astrochemistry of dynamically evolving astronomical regions. It provides a comprehensive description of this important area of science, stressing in particular the methods that have been developed for specific purposes. It will be of interest to researchers in astrochemistry, including both chemists and physicists and could form the basis of a postgraduate course for research students in chemistry and physics.

Hardback | 250 pages | 9781782627760 | 2017 | £159.00 | \$260.00 



Textbooks, popular science and standalone titles

A Flash of Light

The Science of Light and Colour

Mark Lorch University of Hull, UK | Andy Miah University of Salford, UK

A Flash of Light is an intriguing book that starts at the beginning of time itself and then winds its way through a host of fascinating light related topics including the hues of aliens sunsets, the psychology of colour, and the chemistry of LCD screens. Drawing on the experience of some of the UK's best science communicators, this book will appeal to anyone with an interest in science. Its pacey, witty and engaging tone provides illuminating insight into how and why we see the universe the way we do.

Paperback | 128 pages | 9781782627319 | 2016 | £12.00 | \$19.00 



Biocatalysis in Organic Synthesis

The Retrosynthesis Approach

Nicholas J Turner University of Manchester, UK | Luke Humphreys GlaxoSmithKline, UK

This unique textbook provides new guidelines for "biocatalytic retrosynthesis" in which molecules are disconnected with consideration for applying biocatalysts in the forward synthesis direction. It aims to enable students to make the connection between biocatalysis and synthesis earlier in their studies and to equip students for the modern world of organic synthesis where biocatalysts play an increasingly important role. Tutorials enable the reader to practise disconnecting target molecules to find the 'hidden' biocatalytic reactions which can be applied in the synthetic direction. It also contains a complete description of the current biocatalyst classes that are available. This textbook is an essential resource for lecturers and students studying synthetic chemistry. It also serves as a handy reference for practising chemists wishing to embed biocatalysis into their synthetic toolbox.

Paperback | 200 pages | 9781782625308 | 2017 | £31.99 | \$59.99 



Chemical and Biological Weapons Prevention

Shape-Memory and Shape-Changing Effects

Michael Crowley University of Bradford, UK | Malcolm Dando University of Bradford, UK | Lijun Shang University of Bradford, UK

In this book, international leaders in various aspects of weapons prevention assess likely future trajectories in the chemical and life sciences the risks of their application in the development of chemical or biological weapons. The current capabilities and limitations of existing international control regimes tasked with the prevention and elimination of chemical and toxin weapons are analysed. This book will be of interest to academic and research communities in the fields of pharmacology, toxicology, social science and those with an interest in the legal and ethical aspects of chemical and biological weapons prevention.

Hardback | 400 pages | 9781782626497 | 2017 | £66.99 | \$110.00 



Coffee

Chemistry, Quality and Health Implications

Adriana Farah Universidade Federal do Rio de Janeiro, Brazil

Coffee is one of the most popular drinks in the world but how does the chemistry influence the quality and what are the health advantages or disadvantages from consuming it? This book is unique in covering coffee production, quality, chemistry, and the health implications from its consumption in one volume. Written by an international collection of contributors in the field who concentrate on coffee research, it is aimed at advanced undergraduates, postgraduates and researchers. It provides an accessible reference to the current research in the field and information on the health aspects for nutritionists and other health professionals.

Hardback | 300 pages | 9781782620044 | 2017 | £59.99 | \$95.00 



Textbooks, popular science and standalone titles

Comprehensive Glossary of Terms Used in Toxicology

John Duffus The Edinburgh Centre for Toxicology, UK | **Douglas Templeton** University of Toronto, Canada | **Michael Schwenk** Federal Public Health Department, Germany

This glossary updates and expands on previous glossaries of toxicological terms provided by IUPAC. Toxicology has become crucial to global trade in chemicals as legislation has become harmonised around the world and is based on the classification of toxicity. This glossary addresses the need for harmonised terminology, especially as toxicology uses terminology from chemistry, medicine, geology, botany, zoology, ecology, and veterinary medicine, as well as some legal terms. This will be a valuable reference for students and researchers in toxicology, those involved in chemicals legislation and regulation and risk assessment.

Hardback | 150 pages | 9781782621379 | 2017 | £66.99 | \$118.00 



Computational Materials Discovery

Artem Oganov Skolkovo Institute of Science and Technology, Russia | **Alexander Kvashnin** Skolkovo Institute of Science and Technology, Russia | **Gabriele Saleh** Moscow Institute of Physics and Technology, Russia

Until a few years ago, new materials could only be discovered experimentally. Now the situation is dramatically different with advances in computational techniques. This is the first book to provide a systematic review of computational materials discovery, covering different methods and materials discovery for specific classes of materials including low-dimensional materials. The book is a convenient introduction for young researchers and industrial scientists to the topic of computational materials design.

Hardback | 430 pages | 9781782629610 | 2018 | £179.00 | \$300.00 



Contemporary Catalysis

Science, Technology, and Applications

Paul C J Kamer University of St Andrews, UK | **Dieter Vogt** University of Edinburgh, UK | **Joris Thybaut** Ghent University, Belgium

Covering the basic principles, this book covers aspects of homogeneous, heterogeneous, organo-, bio- and computational catalysis. It discusses catalyst preparation, catalyst characterization and reactor engineering, and explores recent developments in the understanding of catalytic mechanism, such as operando spectroscopy. Several important case studies using industrial applications are given. It is an integrated approach ideal for graduate students from a range of backgrounds, including catalysis, engineering and organic synthesis.

Hardback | 900 pages | 9781849739900 | 2017 | £86.99 | \$143.00 



Detection of Drug Misuse

Biomarkers, Analytical Advances and Interpretation

Kim Wolff King's College London, UK

This text describes the current state-of-the-art techniques used for identifying and confirming drug misuse as well as recent advances in biomarkers, instrumentation and analysis methodology. The title discusses both recreational and designer drugs, including non-addictive and addictive drugs. This book is a useful and fascinating resource for healthcare professionals working in the field of drug misuse as well as academics and postgraduates researching within analytical, chromatography, medicinal and pharmaceutical chemistry; drug metabolism; addiction science; and forensic toxicology, science and medicine.

Hardback | 500 pages | 9781782621577 | 2017 | £86.99 | \$143.00



Textbooks, popular science and standalone titles

Discovering Cosmetic Science

Stephen Barton Skin Thinking Ltd., UK | Brigitte West Beauty by the Geeks Ltd, Newcastle University, UK

Cosmetic science and the personal care industry are often misrepresented. This book will educate and inform the public and the wider science community about the sound science they are based on. In the process many positive aspects of cosmetic chemistry can be revealed, from creating colours, fragrances and sensorial formulations to understanding the important interactions of UV light with organic and inorganic absorbers and blending these for effective SPF sunscreens. Providing background material for education and as an accessible scientific title for the interested lay reader, this book shows chemistry in an everyday context based on the real world and dispelling the many myths.

Paperback | 360 pages | 9781782624721 | 2017 | £19.99 | \$32.00



Distilling

Ian Hornsey Nethergate Brewery, UK | Christopher Hayman Hayman Distillers, UK

As happened in the world of brewing some forty years ago, there is an increased interest in distilled beverages. This is most patently exemplified by the plethora of new craft distilleries in the United States and, more recently, United Kingdom. This book covers the historical and practical aspects of distillation, before embarking upon treatments of all the major groups of distilled beverage. Whiskies and gins are covered and other beverages, that were and are essentially grain-based but can be made from alternative raw materials, eg vodka, aquavit, are also considered. Distillation of flavoured spirits and those from botanical and phytochemical sources are also detailed. Written by experts in the field of brewing and distilling, this book will be an exciting addition to the literature and provides practical details for researchers and industrial distillers.

Paperback | 300 pages | 9781782625179 | 2018 | £33.99 | \$54.00 



Engineering Health

How Biotechnology Changed Medicine

Lara Marks King's College London and the University of Cambridge, UK

Biotechnology is one of the hot growth areas in medicine today, with significant recent increases in global investment. Despite the importance of this growth, much of this information does not reach people beyond the scientific community. This book provides an overview of the fundamental role biotechnology plays in medicine for the lay reader. Written in an engaging and accessible style, Engineering Health covers biotechnology in drug discovery, the manufacturing of products and the safety, delivery and cost of today's medicines.

Paperback | 350 pages | 9781782620846 | 2017 | £23.99 | \$37.50



Enthalpy and Internal Energy

Liquids, Solutions and Vapours

Emmerich Wilhelm University of Vienna, Austria | Trevor Letcher

Containing the very latest information on all aspects of the properties of enthalpy and internal energy as related to liquids and vapours, either pure or mixed, this book brings all the information into one place providing the possibility of synergistic developments in the broader field of applied chemical thermodynamics. Written by acknowledged experts in their respective fields, the chapters cover theory, experimental methods and techniques and results for all types of liquids and vapours. These properties are important in all branches of pure and applied thermodynamics and this book, combining essentially all related areas, is an important contribution to the subject. Aimed at providing a key point of reference for graduates, researchers and anyone working in this field and in related areas, it will be a valuable addition to the literature in the area.

Hardback | 500 pages | 9781782627111 | 2017 | £179.00 | \$300.00 



Textbooks, popular science and standalone titles

Essential Mathematics for NMR Spectroscopists

Keith C Brown University of Saskatchewan, Canada

Beginning with a review of the important areas of mathematics, this book then covers many of the underlying theoretical and practical aspects of NMR spectroscopy from a maths point of view. Competence in algebra and introductory calculus is needed but all other maths concepts are covered. It will bridge a gap between high level and introductory titles used in NMR spectroscopy. Uniquely, it takes a very careful and pedagogical approach to the mathematics behind NMR. It leaves out very few steps, which distinguishes it from other books in the field. This is an essential text aimed at graduate students who are beginning their careers in NMR spectroscopy and laboratory managers if they need an understanding of the theoretical foundations of the technique.

Hardback | 551 pages | 9781782627975 | 2017 | £86.99 | \$143.00 



Fundamentals of Smart Materials

Mohsen Shahinpoor University of Maine, USA | Hans-Jorg Schneider Universität des Saarlandes, Germany

A new textbook consisting of a workbook and solutions manual covering the fundamentals of different functional material systems aimed at advanced undergraduate and postgraduate students. Each chapter includes an introduction to the material, its applications and uses with example problems, fabrication and manufacturing techniques, conclusions, homework problems and a bibliography. Written by leading authors in smart materials, topics include piezoelectric materials, magnetostrictive materials, shape memory alloys, mechanochromic materials, thermochromic materials, chemomechanical polymers and self-healing materials.

Hardback | 480 pages | 9781782626459 | 2017 | £76.99 | \$138.00 



Genomics and Clinical Diagnostics

David Whitehouse University of Hertfordshire, UK | Ralph Rapley University of Hertfordshire, UK

With large genome initiatives being announced around the world, this book provides a timely graduate level introduction to molecular diagnostics technologies and applications to enable readers to embrace the subject and original literature. The first of four sections delivers readily accessible introductory information on the purposes, properties and drawbacks of diagnostic tests followed by chapters on the principal molecular technologies that underpin the information in the later sections. The following two sections provide more specialised examples of currently used diagnostic technologies and insights into selected key diagnostic challenges including specific examples, automation and point of care testing. The book concludes with a section on future prospects focusing on mutation detection for personalised medicine, for example in cancer.

Hardback | 550 pages | 9781782628217 | 2017 | £76.99 | \$138.00 



GC-MS Instrumental Analysis

How do I?

Gas chromatography–mass spectrometry (GC-MS) can be used in everything from environmental monitoring and food safety to forensic science and medicine. This textbook introduces students and scientists who are new to GCMS to all of the steps involved in using this technique as part of a research process. Throughout the book, case studies illustrate the process, the techniques used and any common challenges. Newcomers can easily search for answers to the “how do I...?” question they may have and find basic and clear advice on how to get started. The book draws on extensive experience teaching GCMS courses in the developing world as part of the Royal Society of Chemistry’s Pan Africa Network supported by GlaxoSmithKline.

Paperback | 400 pages | 9781782629283 | 2018 | £37.99 | \$40.00 



Textbooks, popular science and standalone titles

Handbook of Surface Plasmon Resonance

2nd Edition

Richard B M Schasfoort University of Twente, Netherlands

Surface plasmon resonance (SPR) plays a dominant role in real-time interaction sensing of bimolecular binding events and with the biosensor field expanding more applications are being found. In response to the market, an update to the original title which was published in 2008 is now appropriate. With over fifty percent of the material being updated, this book provides a total system description including optics, fluidics and sensor surfaces. Spanning theory, instrumentation and applications it covers all the relevant issues for the practicing researcher. Intended for a wide audience, it contains expanded tutorial details for inspiring students to use and is a comprehensive accessible guide.

Hardback | 600 pages | 9781782627302 | 2017 | £179.00 | \$300.00 



Industrial Polymer Applications

Essential Chemistry and Technology

William R Ashcroft

Industrial Polymer Applications provides a comprehensive overview of the diverse properties and applications of thermoset and thermoplastic polymer technologies used routinely in the protection, repair, restoration and bonding of the main classes of industrial engineering materials such as concrete, masonry, wood, metal, rubber, plastic, glass and advanced ceramics. Written in an accessible way, the book provides a supplementary text for undergraduates, postgraduates and industrialists who have studied or are involved in chemistry, polymer chemistry, industrial chemistry, materials science, chemical engineering, mechanical engineering, civil engineering or corrosion engineering, science and technology.

Paperback | 215 pages | 9781782628149 | 2017 | £35.99 | \$59.99 



Intermolecular Interactions in Crystals

Fundamentals of Crystal Engineering

Juan Novoa University of Barcelona, Spain

Crystal Engineering concerns the design and synthesis of molecular crystals with desired properties, which requires a deep understanding of intermolecular interactions. This new book brings together all the current information about the most relevant intermolecular interactions providing an introductory text for graduates. The textbook introduces the nature and identification of bonds and the latest knowledge of their physical meaning. Properties of the most relevant intermolecular bonds identified in molecular crystals are described. Cooperative effects from different bond types present in one solid are also explained.

Hardback | 250 pages | 9781782621737 | 2017 | £86.99 | \$140.00 



Membrane Engineering for the Treatment of Gases

2nd Edition 2-volume Set

Enrico Drioli The Institute on Membrane Technology, National Research Council, Italy | Giuseppe Barbieri The Institute on Membrane Technology, National Research Council, Italy | Adele Brunetti The Institute on Membrane Technology, National Research Council, Italy

Elaborating on recent and future developments in the field of membrane engineering, this two-volume set forms an innovative reference work on membrane engineering and technology in the field of gas separation and gaseous phase membrane reactors. Volume 1 focuses on new membrane materials recently emerged in gas separation, and Volume 2 is devoted to the main advances in gaseous phase membrane reactors and separators.

Hardback | 1000 pages | 9781782628965 | 2017 | £250.00 | \$400.00 



Textbooks, popular science and standalone titles

Metals in Biology and Medicine

A Chemical Approach

Peggy Carver University of Michigan, USA | Vincent Pecoraro University of Michigan, USA | Gianni Valensin University of Siena, Italy | Henryk Kozłowski University of Wrocław, Poland

Metals in Biology and Medicine provides students of chemistry, biochemistry, molecular biology and pharmaceutical sciences who are learning bioinorganic chemistry as part of their degree with a comprehensive understanding of the subject. The book emphasises a molecular approach to understanding whilst highlighting clinical aspects through the logical presentation of the co-ordination chemistry, followed by metals in biology, in homeostasis, in disease and in medicine. The book contains teaching aids and cues for group learning discussions.

Hardback | 600 pages | 9781782626503 | 2018 | £86.99 | \$143.00 



Microfluidics and Lab-on-a-Chip

Andreas Manz Universität des Saarlandes, Germany | Mark D Tarn University of Leeds, UK | Giuseppina Simone University of Naples "Federico II", Italy | Eric R Castro

Covering the fast and dynamic development of miniaturization, μ TAS and microfluidics, this accessible text is unique in its approach. The chapters provide the tools for analysing phenomena from the scientific point of view and aids for implementing quantitative/qualitative models including applications in cell biology and bioanalytical chemistry. Providing a short, affordable text for students that includes sufficient information to open up this area to them, this book is useful to a wide audience, students that for the first time approach the field, as well as engineers, physicians, cell biologists, biochemists, microbiologists, geneticists, and medical researchers.

Paperback | 200 pages | 9781782628330 | 2017 | £35.99 | \$59.99 



Nanotechnology

The Future is Tiny

Michael Berger Nanowerk LLC, Germany

Following the success of *Nano-society*, Nanotechnology: The Future is Tiny introduces 160 specific research projects that are currently being investigated in laboratories distributed throughout the world. Through interviews and descriptions of these projects the author provides the reader with a unique commentary on the current state of the art of nanotechnology, through the scientists' own words.

Hardback | 350 pages | 9781782625261 | 2016 | £66.99 | \$118.00 



Natural Product Biosynthesis

Chemical Logic and Enzymatic Machinery

Christopher T Walsh Stanford University, USA | Yi Tang University of California Los Angeles, USA

Authored by leading experts, this textbook provides a thorough description of the types of natural products, the biosynthetic pathways that enable the production of these molecules, and an update on the discovery of novel products in the post-genomic era. Appropriate to this modern era, the approach of this book is to codify the chemical logic that underlies each natural product structural class as they are assembled from building blocks of primary metabolism. This text will serve as a reference point for chemists, as well as for computational biologists, pharmacognocists, chemical ecologists, bioengineers and synthetic biologists.

Hardback | 600 pages | 9781788010764 | 2017 | £86.99 | \$143.00 



Textbooks, popular science and standalone titles

Near Infrared Spectroscopy and Imaging for Cultural Heritage

Matija Strlič University College London, UK | Tom Fearn University College London, UK

Near infrared (NIR) spectroscopy offers a non-destructive, non-invasive, and portable solution for many problems associated with heritage material identification and characterisation. This book is intended as reference to this emerging technique for students and professionals wishing to adopt this ideal tool for rapid art and heritage collection surveys or for the conservation of heritage materials. The editors have brought together contributors at the forefront of this new technique, presenting its application to a wide range of cultural, historic, and archaeological materials.

Hardback | 250 pages | 9781849739252 | 2017 | £149.99 | \$245.00 



Pharmacology for Chemists

Drug Discovery in Context

Raymond Hill Imperial College London, UK | Terry Kenakin University of North Carolina, USA | Tom Blackburn TPBioventures LLC, USA

Assuming little previous knowledge of biology, this book aids graduate chemists to close the gap in their knowledge of pharmacology and make the link between medicinal chemistry and the way in which drugs act on the body. The availability of receptor structures has revolutionised drug discovery and development necessitating an up-to-date source of information for chemists entering this new pharmacological world. Chapters explain the history of pharmacology, the relationship between receptor structure and function and receptor pharmacology relevant to drug design. This unique textbook will be an essential resource for chemists planning to work in drug discovery, or postgraduate students and practising chemists interested in expanding their pharmacology knowledge.

Hardback | 350 pages | 9781782621423 | 2017 | £86.99 | \$143.00 



Poisons and Poisonings

Death by Stealth

Tony Hargreaves

Today, there may well be more poisons available to the individual than ever before, but there are also advances in medical examination and forensic analysis that increase the likelihood of the poisoner being caught. This book will examine poisons, both natural and man-made menaces, and cases based on a particular poison as well as information about how forensic analysis is conducted. Appealing to scientists and non-scientists alike, this enthralling book will entertain and educate and bring the reader up to date with how important chemical analysis is in crime detection.

Paperback | 200 pages | 9781782627173 | 2017 | £21.99 | \$35.00



Solid Rocket Propellants

Science and Technology Challenges

Haridwar Singh Defense Research and Development Organisation, India | Himanshu Shekhar Defense Research and Development Organisation, India

Presenting up-to-date practical and theoretical aspects of rocket propellants and propulsion, this book is a much needed addition to the post graduate level literature. Covering all relevant information including formulation, processing and evaluation, it will be vital for students and researchers working in the area of solid rocket propellants in all sectors namely academics, the propellant industry, propellant production, quality control and associated agencies such as the armed forces, defence and space organisations. The authors bring together a wealth of accumulated knowledge into one book aiding future generations to meet the challenges in this area.

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Textbooks, popular science and standalone titles

The Chemical Story of Olive Oil

From Grove to Table

Richard Blatchly Keene State College, USA | Zeynep Delen Boğaziçi University, Turkey | Patricia O'Hara, Amherst College, USA

Providing the chemist's view of the production, use and impact of olive oil, readers get a deeper understanding of what makes an Extra Virgin Olive Oil (EVOO) authentic, and how scientists are fighting the battle against fraud. Olive oil is a very valuable commodity worldwide and introducing the chemicals allows the authors to provide a richer explanation of the techniques of growing and processing, as well as of the impact on humans such as taste and health effects. Food scientists and those who work in processing as well as the interested lay reader will find this a fascinating book.

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The Chemistry of Plants and Insects

Plants, Bugs, and Molecules

Margareta Sequin San Francisco State University, USA

This book explains the natural chemical compounds that determine the fascinating interactions between plants and insects providing a gentle and absorbing introduction to organic chemistry, as well as plant ecology and entomology. This book makes chemistry exciting and accessible for readers interested in a deeper understanding of the natural world. It also serves as a useful teaching aid for undergraduate chemistry or biology courses, and as a supplementary text for students studying plant sciences, ecology, and entomology, and in horticultural programs.

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5th Edition

John W Nicholson Bluefield Centre for Biomaterials Ltd, UK and Queen Mary University of London, UK

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Mark Lorch University of Hull, UK | Andy Miah University of Salford, UK

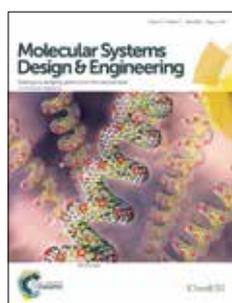
If superhero powers were a reality, what else might be true? What scenes and science are missing from the movies that must logically follow from their powers? This book aims to introduce a whole range of scientific concepts, from protein chemistry to particle physics, by examining the superhero abilities of comic book and film characters.

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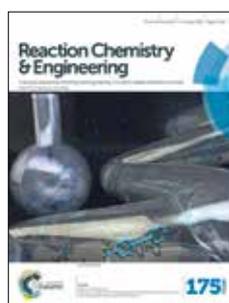
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Murray Robertson Visual Elements, UK

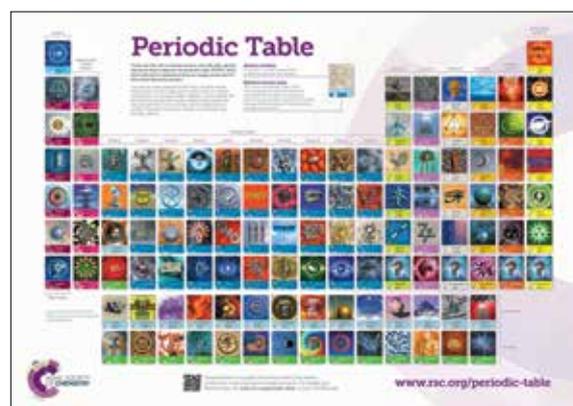
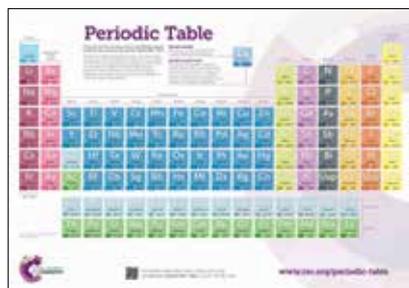
A bold and clear new representation of the periodic table from the Royal Society of Chemistry. The poster is two-sided: on one side, a Visual Elements version, with fascinating element artwork by Murray Robertson based on scientific data provided by the chemist and science writer John Emsley; on the other, a bold colour-coded version, emphasising readability and clarity. Printed in full colour, there are two sizes of the wallchart available: A0 (1189 x 841 mm) and 2A0 (1682 x 1189 mm). Information for each element includes the name, chemical symbol, atomic number, and relative atomic mass. The groups are readily identifiable by colour, and the wallchart has been updated to include elements 110, 111, 112, 114, and 116. We've designed the wallchart to be readable, visually engaging, and an excellent addition to any classroom, laboratory, or office. Price shown does not include VAT in the EU.

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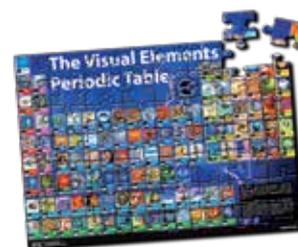


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Murray Robertson Visual Elements, UK

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Index

A	A Flash of Light: The Science of Light and Colour	49	Contrast Agents for MRI: Physical Methods	34
	Advances in Photoelectrochemical Water Splitting: Theory, Experiment and Systems Analysis	12	Cross-relaxation and Cross-correlation Parameters in NMR: Molecular Approaches	34
	Aggregation Induced Emission: Faraday Discussion	15	Cyclic Peptides: From Bioorganic Synthesis to Applications	6
	Alternatives to Conventional Food Processing: 2nd Edition	21	D Detection of Drug Misuse: Biomarkers, Analytical Advances and Interpretation	50
	Amino Acids: Volume 42	44	Diatom Nanotechnology	31
	An Introduction to Ionic Liquids: 2nd Edition	48	Dienamine-, Trienamine- and Aminoenyne-mediated Reactions in Organic Synthesis	4
	Animal Genetics for Chemists	48	Discovering Cosmetic Science	51
	Antibiotic Drug Discovery: New Targets and Molecular Entities	9	Distilling	51
	Artificial Photosynthesis: Faraday Discussion	15	Drug Discovery for Leishmaniasis	10
	Astrochemistry in the Dynamical Interstellar Medium	48	E Ecotoxicology and Genotoxicology: Non-traditional Aquatic Models	26
	Atmospheric Chemistry in the Anthropocene: Faraday Discussion	15	Ecotoxicology and Genotoxicology: Non-traditional Terrestrial Models	26
B	Beyond Chemical Topology: Tangles, Weavings and Ravels	30	Edible Oil Structuring Concepts: Methods and Applications	18
	Big Data in Predictive Toxicology	25	Electrochemical Reduction of Carbon Dioxide: Overcoming the Limitations of Photosynthesis	12
	Biobased Aerogels:		Electrochemistry: Volume 14	45
	Polysaccharide and Protein-based Materials	21	Engineering Health: How Biotechnology Changed Medicine	51
	Biocatalysis: An Industrial Perspective	4	Enthalpy and Internal Energy: Liquids, Solutions and Vapours	51
	Biocatalysis in Organic Synthesis		Environmental Impacts of Road Vehicles: Past, Present and Future	24
	The Retrosynthesis Approach	49	Essential Mathematics for NMR Spectroscopists	52
	Bionanodesign: 2nd Edition	31	F Fabrication and Applications of ZnO Nanostructures	31
	Biophysical Techniques in Drug Discovery	9	Fast Pyrolysis of Biomass: Advances in Technology	22
	Bioplastics and Biocomposites: A Practical Introduction	21	Food Irradiation Technologies: Applications for Preservation	18
	Bio-resources: Feeding a Sustainable Chemical Industry Faraday Discussion	16	Formaldehyde: Exposure, Toxicity and Health Effects	26
C	Carbohydrate Chemistry: Volume 43	44	Functional Supramolecular Materials: From Surfaces to MOFs	30
	Catalysis: Volume 29	44	Fundamentals of Smart Materials	52
	Chemical and Biological Weapons Prevention	49	GC-MS Instrumental Analysis: How do I?	52
	Chemical Health Threats: Assessing and Alerting	25	G Genomics and Clinical Diagnostics	52
	Chemical Modelling: Volume 14	45	H Halogen Bonding in Supramolecular and Solid State Chemistry: Faraday Discussion	16
	Chemical Physics of Electroactive Materials: Faraday Discussion	16	Handbook of Surface Plasmon Resonance: 2nd Edition	53
	Chemistry Crosswords	58	Hazardous Reagent Substitution: A Pharmaceutical Perspective	22
	Click Polymerization	37	I Industrial Polymer Applications: Essential Chemistry and Technology	53
	Coal in the 21st Century: Energy Needs, Chemicals and Environmental Controls	24	Inorganic Two-dimensional Nanomaterials: Fundamental Understanding, Characterizations and Energy Applications	39
	Coffee: Chemistry, Quality and Health Implications	49	Integrated Solar Fuel Generators	13
	Cold Chemistry: Molecular Scattering and Reactivity Near Absolute Zero	42	Intensification of Bio-based Processes	22
	Complex Molecular Surfaces and Interfaces: Faraday Discussion	16	Intermolecular Interactions in Crystals: Fundamentals of Crystal Engineering	53
	Comprehensive Glossary of Terms Used in Toxicology	50		
	Computational Materials Discovery	50		
	Computational Tools for Chemical Biology	6		
	Contemporary Catalysis: Science, Technology, and Applications	50		
	Continuous Flow Reactors: From an Emerging Tool to a Mainstream Technology	22		

L	Laboratory Teaching in Higher Education Chemistry	3	Characterizing Natural Products and Other Organic Compounds	36
	Laser Processing of Materials for Medical Applications	39	Organometallic Chemistry: Volume 42	46
	Light in Forensic Science: Issues and Applications	8	Organophosphorus Chemistry: Volume 46	46
	Lignin Valorization: Emerging Approaches	13	Oxidative Stress and Redox Signalling in Parkinson's Disease	27
	Liquid Salts for Energy and Materials: Faraday Discussion	16	P Patents in Drug Discovery	10
	London Dispersion Forces in Molecules	42	Pharmaceutical Formulation: The Science and Technology of Dosage Forms	10
M	Macromolecules Incorporating Transition Metals: Tackling Global Challenges	37	Pharmacology for Chemists: Drug Discovery in Context	55
	Magnetic Nanomaterials: Applications in Catalysis and Life Sciences	39	Photochemistry: Volume 45	46
	Mass Spectrometric Characterisation of Lignin and Related Compounds: New Techniques	33	Poisons and Poisonings: Death by Stealth	55
	Mass Spectrometry in Chemical Biology: Evolving Applications	7	Practical NMR for Oil and Gas Exploration	36
	Mechanisms of Primary Energy Transduction in Biology	7	Protein Crystallography: Challenges and Practical Solutions	7
	Mechanochemistry in Materials	37	R Reaction Rate Theory: Faraday Discussion	17
	Membrane Engineering for the Treatment of Gases: 2nd Edition 2-volume Set	53	Reactive Inkjet Printing: A Chemical Synthesis Tool	40
	Metallomics: Principles and Applications	28	Regulatory Toxicology in the European Union	27
	Metals in Biology and Medicine: A Chemical Approach	54	S Sensing Techniques for Food Safety and Quality Control	19
	Microalgal Hydrogen Production	8	Small-molecule Transcription Factor Inhibitors in Oncology	10
	Microfluidics and Lab-on-a-Chip	54	Smart Ionic Liquids	40
	Miktoarm Star Polymers: From Basics of Branched Architecture to Synthesis, Self-assembly and Applications	38	Smart Materials for Tissue Engineering: Applications	41
	Modern Biocatalysis: Advances Towards Complex Synthetic Biological Systems	5	Solid Rocket Propellants: Science and Technology Challenges	55
	Modern Methods in Solid-State NMR: A Practitioner's Guide	35	Soy Protein-based Blends and Composites	23
	Molecularly Imprinted Polymers for Analytical Chemistry Applications	38	Steviol Glycosides: Analysis and Applications of Stevia	19
N	Nanogels for Biomedical Applications	40	Supramolecular Amphiphiles	30
	Nanoscience: Volume 4	45	Surface Enhanced Raman Scattering - SERS: Faraday Discussion	17
	Nanostructured Materials for Type III Photovoltaics	32	Sustainable Solvents: Perspectives from Research, Business and International Policy	23
	Nanotechnologies in Food: 2nd Edition	32	Sustainable Synthesis of Pharmaceuticals: Using Transition Metal Complexes as Catalysts	23
	Nanotechnology: The Future is Tiny	54	Synthetic Biology: Volume 3	46
	Nanotoxicology: Experimental and Computational Perspectives	26	T The Biological Chemistry of Nickel	28
	Natural Product Biosynthesis: Chemical Logic and Enzymatic Machinery	54	The Chemical Story of Olive Oil: From Grove to Table	56
	Near Infrared Spectroscopy and Imaging for Cultural Heritage	55	The Chemistry of Plants and Insects: Plants, Bugs, and Molecules	56
	New Directions in Porous Crystalline Materials: Faraday Discussion	17	The Chemistry of Polymers: 5th Edition	56
	NMR in Glycoscience and Glycotechnology	35	The Science Behind the Superheroes	56
	NMR-based Metabolomics	35	Theranostics and Image Guided Drug Delivery	11
	Non-conventional NMR Detection Methods	35	X X-Ray Free Electron Lasers: Applications in Materials, Chemistry and Biology	13
	Nuclear Magnetic Resonance: Volume 46	45	Z Zebrafish in Drug Discovery	11
O	OLED and QLED Displays and Lighting: Materials, Processing and Production	40	Zeolites in Catalysis: Properties and Applications	5
	Optimizing NMR Methods for Structure Elucidation:			

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